

3-28-2024

Strategies Used To Implement E-government Projects In Nigeria

Oyetunde Charles Oyediran
Walden University

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Walden University

College of Management and Human Potential

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Oyetunde Charles Oyediran

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the review committee have been made.

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Walden University
2024

Abstract

Strategies Used to Implement E-Government Projects in Nigeria

by

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MSc, Walden University, 2024

MBA, University of Lagos, Nigeria, 1999

B. Tech. Federal University of Technology, Minna, Nigeria, 1992

Doctoral Study Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Information Technology

Walden University

March 2024

Abstract

Some Nigerian IT project managers lack strategies for designing and developing practical and useable e-government systems, resulting in poor end-user adoption. Grounded in the technology acceptance model, the purpose of this qualitative pragmatic inquiry study was to explore the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems. The population comprised 12 qualified and experienced government IT project managers in Lagos State, Nigeria. Data were collected through semi-structured interviews and documents from public sources; data analysis was done via thematic analysis. Four themes emerged: the importance of user-centered design, engaging end-user feedback in system development, utilizing simple software design and development strategy, and following best practices in the design and development process. Recommendations are that IT project managers apply code refactoring, modular design, and abstraction to enhance code agility and simplicity. The implications for positive social change include the potential for adding to the knowledge of developers to create useful systems while providing employment opportunities and improving the standard of living of Nigerians.

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Dedication

I dedicate this research study to the Almighty God, the Helper of the helpless, the One who gives strength to the weak - Isaiah 41:14-15, 40:29-31. Reflecting on my lowly background it is only by God's grace that I could achieve this feat since the race is not to the swift, nor the battle to the strong - Eccl 9:11.

Also, I dedicate this research study to my wife, Olufunke, and children, Toluwanimi, Oluwatosin, and Rereoluwa, for their support and encouragement. My wife stood by me day and night; she changed her program because of me, denying herself sleep to keep me company and encourage me while I burnt the midnight oil.

Acknowledgments

I wish to express my profound appreciation and gratitude to the team of scholars whose guidance and mentorship helped me to navigate and successfully complete my doctoral study. Special thanks to my committee chair and mentor, Dr. Osama Ahmed Morad, who painstakingly shaped my academic prowess and doctoral writing skills. I sincerely appreciate your firm commitment to excellence. Special thanks to my second committee member, Dr. Constance Blanson, whose tutelage and mentoring refined and focused my intellectual direction. Your comments and feedback in each of each review of my research study guided me to conform to Walden University's standards. I would like to thank Dr. Gail Miles, DIT Program Director, for the faculty support throughout my doctoral program.

Special thanks to my wife, who was my companion, supporter, and encourager throughout all the years of my doctoral journey. Finally, I thank the Walden University faculty and staff for the invaluable knowledge imparted to me, making me a better person.

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Section 1: Foundation of the Study

Background of the Problem

Technology innovation has transformed the world and enhanced the sectors of various economies (Jayaprakash & Pillai, 2022). Realizing the tremendous benefits and transformation it could bring to the economy, the Federal Government of Nigeria (FGN), like some other developing countries, provides annual budget for targeted investment in e-government technologies to transform the country into a digital economy (Aziz et al., 2023). However, many of the e-government projects in Nigeria have failed because the systems are not useful and useable, resulting in poor user engagement and adoption (Omohwovo et al., 2020). It is either the e-government projects awarded were not implemented while others that were implemented did not go live or failed shortly after go-live (Aziz et al., 2023); therefore, the majority of e-government projects embarked on by the Nigerian government are classified as failed projects (Omohwovo et al., 2020) due to reasons such as poor planning, weak technology adoption by the users, wide design-reality gap, unclear scope definition, weak risk analysis, poor project management strategy, corruption, budget slippage, frequent changes in government policies and regimes, engagement of incompetent consultants, etc.

According to the Project Management Institute (2021), a project is a temporary endeavor aimed at creating a unique result to be accomplished at a set time, budget, and agreed specifications. Therefore, project failure ensues when a project does not meet its set parameters - agreed timeline, budget, scope, or when the system is not used. Also, Jayaprakash and Pillai (2022) argued that regardless of a project's completion time, cost,

and scope, it can be considered as failed if it does not fulfill its planned purpose or business requirements. Since digitization and e-government services are vehicles for economic growth, this study is aimed at identifying the strategies the Nigerian government IT project managers use for designing and developing useful and useable e-government systems thereby increasing end-user adoption and serving as a catalyst for digital transformation (Samsor, 2020) for the Nigerian economy.

Problem Statement

The current strategies and other practices used by the Nigerian government IT project managers to design and develop e-government systems lead to low utilization and poor adoption. A wide design-reality gap, amongst others, has been identified to be a significant root cause of e-government systems low user adoption (Jayaprakash & Pillai, 2022). Omohwovo et al. (2020) pointed out that only 15% of e-government systems in Nigerian enjoy high end-user engagement and adoption. The general IT problem is that some Nigerian government IT project managers lack the knowledge of designing and developing e-government systems. The specific IT problem is that some Nigerian government IT project managers lack strategies for designing and developing useful and useable e-government systems.

Purpose Statement

The purpose of this qualitative pragmatic inquiry study is to explore the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems. The targeted population for this research comprises of the FGN's IT project managers who deploy e-government projects for government

institutions in Lagos State of Nigeria and having strategies for designing and developing useful and useable e-government systems thereby increasing technology adoption.

The findings from this study may potentially contribute to positive social change by providing effective strategies and standardized mechanisms to guide the development of useful and useable e-government systems thereby increasing end-user engagement and adoption rates in Nigeria. Also, this study may contribute to positive social change by enhancing the knowledge of the FGN e-government project managers and technology researchers; e-government services may benefit Nigerian citizens by improving e-learning, easy access to online government services, bridging the gap between government and the citizens, and providing employment opportunities leading to a better standard of living for the Nigerian population.

Nature of the Study

The research methodology used for this study is qualitative method, and the study purpose is to explore the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems. I chose the qualitative research method for this study because qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem, identifying their specific interest such that individuals perceive, experience, and make sense of the world. It involves analyzing data from participants that inductively build from particulars to general themes (Suadik, 2022). The qualitative research method is appropriate for this study because my intention is to explore the strategies used by the Nigerian government IT project managers for designing and

developing e-government systems that are useful and useable. Researchers use the quantitative research method to determine causations or trends and testing of a hypothesis through statistical analysis of collected numerical data (Iqbal et al., 2020). In this study, I did not test, approve, or disprove a hypothesis, so quantitative methodology was not valid for this study. Mixed-methods research consolidates quantitative and qualitative data to present a comprehensive and cohesive viewpoint; it uses both open-ended and closed-ended questions, multiple forms of data which are analyzed through statistical and text analyses (Newman, 2022). I did not use the mixed methods approach since this study did not contain a quantitative component.

For this study, I chose the pragmatic inquiry design with qualitative research method to collect qualitative data from multiple individuals and organizations for comparison and analysis. The multiple pragmatic inquiry design is used to understand a real-life phenomenon from multiple perceptions (Reber, 2022) of experienced Nigerian government e-government project managers. I chose pragmatic inquiry because I have direct access to my population/interviewees; also, the pragmatic inquiry is more practical than single or multiple case studies since it does not involve gatekeepers or prior official permission to interview people in partner organizations. Having direct access to my participants allowed me to gain time that could have been used seek gatekeepers.

Researchers use ethnographic design to examine and understand the shared patterns of the culture of individuals or groups (Krause, 2021). I did not choose the ethnographic design because the focus of this study was not to describe or address cultural issues associated with developing e-government projects in Nigeria. The

phenomenological design is a philosophical approach regarding commonalities of people that experienced a particular phenomenon and provides the researcher with a means to describe individual lived experiences (Reber, 2022). Since the focus of this research was not to describe or determine the lived experiences or perspectives of participants living through a phenomenon, the phenomenological approach was inappropriate for this study. I chose the qualitative research method for this study because qualitative research is an approach for exploring and understanding the meaning individuals or groups ascribe to a social or human problem and it involves analyzing data collated from participants that inductively build from particulars to general themes (Sun et al., 2023).

Research Question

What strategies do Nigerian government IT project managers use for designing and developing useful and usable e-government systems?

Interview Questions

1. Describe your current role and how long you have been in similar roles.
2. Describe how you design and develop an e-government system that helps end-users to speedily accomplish their service needs.
3. What strategies did you use to design and develop e-government systems that are useful to users?
4. Describe how did you overcome the obstacles to designing and developing effective e-government systems that achieved its purpose of bridging the gap between the system implementation and citizens' needs.

5. In your experience, what strategies did you use to design and develop e-government systems to achieve seamless adoption by citizens?
6. What design and development strategies did you use for users to find the system useful?
7. Explain the design and development strategies you applied to make the e-government system easy to learn.
8. Describe the strategies used to make the use and operation of the system easy for different end-users' tasks.
9. Describe the design and development strategies used to enhance the citizens' understanding of interacting with the e-government systems?
10. If you had to do it all over again, please explain the changes in approach, design, development, and strategic implementation you would incorporate or change.
11. What other information would you like to add regarding e-government implementation strategies that could be used to improve system usefulness and ease of use of e-government deployment? Please provide details.

Conceptual Framework

The conceptual framework upon which this study is grounded is the technology acceptance model (TAM) used by researchers to understand end-users' behavior towards acceptance and usage of a new technology. TAM was developed by Fred Davis and Richard Bagozzi in 1989; it is an information systems theory that suggests that the following attitudinal factors influence users' acceptance and usage of a new technology

(Davis et al., 1989): (a) perceived usefulness (PU), the degree to which a user believes that using the system would enhance his job performance. If the technology is useful, people will have a positive attitude towards it. (b) Perceived ease-Of-use (PEOU), degree to which a user believes that using a particular system would be easy. If the technology is user-friendly, people will have a positive attitude towards it. Sholikhah and Sutirman (2020) defined behavior as a response or reaction to an external stimulus; this aligns with planned behavior theory, which affirms that behavior is an action carried out based on the factors that influence it. Therefore, users' behavior is a major factor in determining the use of a technology. TAM proposed that PU and PEOU form attitudes which is an external social factor that influences their intention to use the technology or otherwise. TAM has been expanded to TAM 2 (Venkatesh & Davis, 2000) and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003), leading to TAM 3 in the context of e-commerce incorporating elements such as trust and perceived risk on system use (Venkatesh & Bala, 2008).

According to Omohwovo et al. (2020), certain obstacles including adoption issues hinder the success of e-government projects in Nigeria; therefore, tackling the obstacles are crucial to the achievement of robust e-government service delivery in Nigeria. The technology adoption model identifies the modifications which must be made to the system by the Nigerian government IT project managers in formulating the strategies for successful design and development of e-government systems. Since human factor is imperative in determining the success of a technology, formulating effective strategies for successful deployment of e-government projects in Nigeria must incorporate the human

factors in terms of attitudes and intentions to use the technology; TAM is an essential model to analyze the factors affecting stakeholders' behavior towards e-government platforms. Therefore, I used TAM as a conceptual model for this study because TAM shows how the positive perception of the end users of a technology can positively impact the adoption of the system resulting in project success and enhancing successful formulation of strategies for designing and developing e-government systems. Since my goal was to understand the strategies used by IT project managers to design and develop useful and useable e-government systems, I used the TAM to demonstrate how individual's behavioral intention (BI) to use a technology can make or mar the success rates of e-government projects in Nigeria. Therefore, TAM was used to determine how PU, PEOU, users' attitudes towards e-government systems, related policies, procedures, standards, and best practices that affect the success rates of e-government projects in Nigeria.

From the above, it is imperative for the Nigerian government IT project managers to be able to decipher the factors that influence stakeholders' or users' attitudes and perceptions towards the use of technology and leverage this knowledge to ensure the success of new technologies. TAM explains this. Since TAM explains the factors that motivate or influence the decision of technology users to adopt and use technology, the TAM theory is relevant, perfectly fits, and applies to this study in explaining, articulating, and grounding this study to explore the strategies Nigerian government IT managers use to implement e-government projects. Understanding the factors that positively influence users' adoption of a system will help the Nigerian government IT project managers

incorporate these factors into their strategies for designing and developing robust e-government projects. TAM postulates that PU and PEOU are factors that influence system users' decisions on how and when they will use technology (Davis, 1989). PU is the perception of the potential user about how the technology will enhance his results, whether the technology would be useful to what he wants to do, and whether it would improve his performance. PEOU explains that the easier a system is to use, the more people have a positive attitude to use it. Also, the study findings will be discussed in relationship to TAM model concepts to validate and refine the conceptual model and the results of the study.

Definition of Terms

E-government. Electronic government (or e-government) is the application of Information and Communication Technologies (ICTs) to government functions and procedures with the purpose of increasing efficiency, transparency, and citizen participation (Putra et al., 2022). ICTs are used as a support tool in developing good governance thereby enhancing effectiveness and efficiency, improved processes, quality of public services, decision-making processes, and allows better communication among different government offices and agencies.

Information and communications technology (ICT). Combines unified communications, integration of telecommunications (telephone lines and wireless signals) and computers, as well as enterprise software, storage and audiovisual, that allow access, storage, transmission, and manipulation of information. ICT refers to the convergence of communication devices, network hardware, satellite systems,

audiovisuals, and telephone networks with computer networks through cabling or linked systems (E. H. Li et al., 2023).

Information security. Is the practice of protecting sensitive information from unauthorized activities, including inspection, modification, recording, and any disruption or destruction by mitigating information risk. The goal is to ensure the safety and privacy of critical data such as customer account details, financial data, or intellectual property (Chen et al., 2021).

Perceived ease-of-use (PEOU). Degree to which a user believes that using a particular system would be free easy (Davis, 1989). If the technology is user-friendly, people will have a positive attitude towards it.

Perceived usefulness (PU). The degree to which a user believes that using the system would enhance his job performance (Davis, 1989). If the technology is useful, people will have a positive attitude towards it.

Project. According to the Project Management Body of Knowledge, a project is a temporary endeavor with a sequence of interrelated tasks to be executed over a fixed period and within certain cost and other limitations to accomplish tasks within a particular time constraints. A project is an activity to create something unique and it must be progressively elaborated (progresses in steps) and continues by increments (Peng et al., 2023).

Project manager. A project manager oversees the planning, executing, monitoring, coordinating, and controlling projects. A project manager is responsible for the day-to-day operations of meeting project goals, such as resourcing, scheduling, task

prioritization, monitoring project plans versus deliverables, providing user training, and ensuring ICT security (Project Management Institute, 2021).

Technology acceptance model (TAM). Is an information systems theory that suggests that attitudinal factors, PU and PEOU, influence users' acceptance and usage of a new technology (Davis et al., 1989). TAM proposes that users' behavior is a major factor in determining the use of the technology (Pérez-Chacón et al., 2021).

Assumptions, Limitations, and Delimitations

Assumptions

Research assumptions are temporary declarations or rejections of the research problem; it could be conjectures about possible characteristics, causes, specific problems, or unproven belief about the study phenomenon that do not need to be tested for validity with statistics (Caggiano & Weber, 2023). Assumptions are requirements that must be fulfilled before analysis is conducted while testing of the assumptions ensures valid conclusions from data analysis. In this study, I assumed that the participants are experienced FGN IT project managers with more than five years' experience in deploying e-government systems and skills for designing and developing useful and useable solutions and reducing design-reality gap to enhance technology adoption. I assumed that the project managers had successfully developed at least two e-government systems in the last 5 years. I mitigated these assumptions by carrying out due diligence on each project manager to vet their experience and previous projects successfully implemented; I also provided them with the background of this study. I assumed that all the participants volunteered honest, unbiased, and complete information

and provided answers to the interview questions based on their experience. To assure participants of confidentiality, I assigned each interviewee a unique code instead of using their names. I assumed that the research questions and semi-structured open-ended interview technique used, and the interviewees' answers, views, and perceptions addressed the research problem to increase success rates of e-government projects in Nigeria.

Limitations

Research limitations reflect the shortcomings of a study in terms of the practical or theoretical constraints encountered in the study, and it limits the study results and conclusions (Patari et al., 2022). This study was limited to the federal, state, and local government e-government projects in Nigeria. Therefore, no investigation was carried out regarding private or corporate institutions outside of government ministries and agencies.

Delimitations

Research delimitations are characteristics of design or methodology that may impact or influence the application or interpretation of research results; they are research characteristics that limit the scope and describe the boundaries of the study. Coker (2022) asserted that delimitations are what a researcher includes and excludes to make a project manageable and focused on the research question.

The delimitations of this study were (i.) that this study was limited to only the Federal, State and Local governments e-government projects in Nigeria, other institutions or corporate bodies were not included. (ii.) The participants considered

were prominent and experienced Nigerian government IT project managers in Lagos State of Nigeria. (iii.) the IT project managers must have successfully implemented at least two e-government projects successfully while meeting the agreed scope, within time and budget in the last 5 years; (iv.) This study is limited to the strategies used to implement e-government projects in Nigeria. (v.) The population location was restricted to Lagos State of Nigeria; therefore, the results of this study may not be generalized or representative of other locations or may not be useful for future research outside the geographical domain used. (vi.) Due to the limited prior research studies on the problem phenomenon, there is a dearth of documented facts about e-government realities in Nigeria to form the basis of my literature review and to lay a foundation for understanding the research problem. (vii.) As pointed out by Yin (2018), another limitation of this study is the tendency of the participants to provide responses that show preferences for what the researcher might want to hear; this may affect the validity of the results which was a dependency on the provision of honest responses to the open-ended semi-structured interview questions.

Significance of the Study

Contribution to Information Technology Practice

This study may contribute to information technology best practices in the following ways: by creating knowledge and understanding of the strategies to implement e-government projects successfully. This study also highlights the local intricacies and dependencies affecting the positive attitude of end users towards the seamless adoption of e-government systems in Nigeria while the technology adoption model is used to

establish the relationship between the research problem and the factors affecting user adoption of e-government systems in Nigeria to explain the study findings. This study also highlights the project risks, deployment methodologies, and other implementation issues that should be considered and addressed to increase the success rate of e-government projects in Nigeria. The study findings may address the systemic social and technological challenges, policy inconsistencies, and local peculiarities often overlooked that are affecting the successful implementation of e-government projects in Nigeria while providing best practices imperatives for increasing e-government successful rates. Since technology adoption issues and other challenges such as inadequate project scope, cost, and timeline slippages could be major obstacles to the success of e-government projects, the findings from this study may help IT leaders, IT project managers, and decision-makers to identify solutions to technology adoption problems, set clear scope, schedule realistic delivery timeline, determine adequate budgetary requirements, identify risks and provide effective mitigations right from the start of the project (Aziz et al., 2023) to increase the success rates of e-government projects. This study may help ensure smooth transition to a new technology as it proffers strategies to enhance technology acceptance and adoption by providing adequate plans for ensuring positive perception of technology changes as catalyst to increasing users' performance and assures that new technology is easy to learn; this removes resistance or rejection of new systems. This study will help maximize return on investment because it enumerates how IT project managers prepare and reevaluate change management practices to encourage positive technology acceptance.

Implications for Social Change

This study may contribute to social change in the following ways: it may help form effective implementation guidelines on e-government projects and how they align with the overall national development strategy. It may improve the success rate of the Nigerian e-government projects coupled with establishing solutions to the factors hindering seamless technology adoption thereby bridging the gap between the government and citizens and engendering trust between the government and the populace. This study may be a useful qualitative research resource and may add to the pool of literature that provide strategies for how Nigeria and other African countries can leverage ICT as a transformation platform to a vibrant digital economic powerhouse (Ajadi et al., 2021). Robust, functional, and efficient e-government platforms may propel the Nigerian economy giving her a competitive edge among the commonwealth of nations; also, it may be a potent platform for boosting local and international e-commerce (Lawan et al., 2020).

Since e-government platforms are key drivers for economic growth, this study may contribute to positive social change in that it may lead to global competitiveness, economic development, improved welfare, and the standard of living for Nigerian citizens (Akpan-Obong et al., 2023). Also, this study may enhance positive social change by improving the lives of ordinary citizens in terms of job creation or employment opportunities, especially for the Nigerian youth, many of whom are being recruited into banditry, kidnapping, cultism, and as political thugs largely due to unemployment and poverty. Another positive social change that this study may bring is increased efficiency

through improved public services due to a better understanding of users' requirements in terms of technology adoption and system requirements facilitating increased government revenue and improving standard of living. E-government may contribute as a medium to share information and ideas with stakeholders to achieve specific government policies; this study may contribute to the FGN's economic reform in fighting corruption through efficient e-government by improving transparency, facilitating information sharing while eradicating inconsistencies thereby improving accountability and transparency in various tiers of government (Lawan et al., 2020). E-government technologies can significantly improve communication between various levels of government and between different government departments to transform administration procedures into the modern digital era. Therefore, the findings from this study may be used for future research to examine the peculiarities of Nigeria and African environments in terms of technology needs, citizens' attitudes and perceptions towards new technologies, and other local intricacies peculiar to Nigeria that must be addressed to ensure increased success rates of e-government projects (Putra et al., 2022).

A Review of the Professional and Academic Literature

The purpose of this qualitative pragmatic inquiry study is to explore the strategies used by FGN's IT project managers to implement e-government projects. I also discuss how the TAM applies to this study by a thorough examination of recent scholarly journal articles related to e-government projects and technology adoption models. In this section, I present a synopsis of e-government projects based on the existing scholarly work and discuss how the conceptual framework, TAM, grounds, explains and connects with the

research problem phenomenon. My primary focus in this study is to develop effective strategies for implementing e-government projects in Nigeria with a view to increasing deployment success rates and identifying factors that influence positive user attitudes towards technology adoption. I identify salient local intricacies that must be properly addressed in the process of project design and implementation to improve the success rate of e-government projects in Nigeria. I studied the impact of efficient project implementation strategies on the success of e-government systems deployments. Also, the purpose of this qualitative pragmatic inquiry study is to gather information shared by experienced selected Nigerian government IT project managers who have recently successfully implemented e-government systems for government institutions in Lagos, Nigeria.

To provide a strong scholarly foundation for this study, I analyze the current body of knowledge related to the strategies Nigerian government IT project managers use to implement e-government projects. To provide a thorough analysis and adequate information on the existing body of knowledge, I subdivide this literature review into the following important components: (a) the Technology Adoption Model (TAM) and how positive perception and adoption affect the success or failure of e-government projects in Nigeria, (b) TAM and how it connects and relates to the research problem in terms of the success of e-government projects in Nigeria, how positive perception and adoption affects the success or failure of e-government projects in Nigeria, (c) the synopsis of e-government projects, (d) the FGN's e-government projects: history, challenges, success, and failure. In my review of the e-government projects in Nigeria, I focus on the history,

progress, challenges, and local peculiarities including social, environmental, and infrastructural deficits affecting the success of e-government in Nigeria. In my review of TAM, I focus on how the Nigeran public/users' attitude towards the use of e-government technology platforms affects the seamless adoption and success of e-government projects.

For this literature review, I use scholarly articles found from Walden's Thoreau Multi-Database Search, ProQuest Central, ProQuest Dissertations and Theses Global, Google Scholar, EBSCO Delivery Service (EDS), SAGE Full-Text Collection, and ScienceDirect. I use Ulrich's database repository to confirm the validity of the peer-reviewed references. I use a total of 246 recent articles for the literature review; out of this, 227 (representing 92%) articles are peer-reviewed, and 223 (representing 90%) articles are within 5 years of my anticipated graduation date in 2024.

In my search for the articles relevant to this study, I use the following key search words/terms and phrases to search the databases for recent articles consistent with my research: *government, e-government, e-government implementation, IT project failure, ICT Implementation, Implementation Strategies, ICT in Africa, Information Technology, ICT, e-Services, IT in Developing Countries, TAM, Technology Acceptance Model, E-government Adoption, and IT Implementation*. I also use search delimiters such as 2020 and 2024 as the year range to search for the recent articles related to my study and published in the last 5 years as required for the literature review. I use other delimiters such as *academic journals* and *peer-reviewed* in my search for relevant sources while

Google Scholar and ProQuest Central were used to locate resources related to government, e-government, and Technology Adoption Model (TAM).

Overview of TAM

Technology explosion has made computer usage inevitably enshrined in virtually all areas of human life, despite this, many people still restrict the use and adoption of new technologies thereby losing the benefits of its inherent innovations (Nisar et al., 2021). Technology literacy is increasingly becoming integrated into daily life thereby forcing some level of technology acceptance and adoption on many. Although decisions to introduce and implement new technologies in organizations, government departments, institutions of learning, and other places are taken at executive management levels, users' adoption patterns go a long way in determining the success of a technology (Laura, 2023). Therefore, it is imperative for IT leaders and project managers to understand why some individuals adopt technology while others resist or reject it. IT leaders and project managers should understand the influence of social implications on an individual's decision to adopt a technology.

The decision of whether an individual would adopt a particular technology or not has long been a source of research across multiple disciplines including government, business, schools, and everyday life. Based on this, many researchers have propounded theories that predict how individuals will malleably use new technologies. However, while most of the theories have been criticized due to their disparate nature in terms of lack of coherence regarding factors that influence the use of technology (Venkatesh et al.,

2003), the Technology Adoption Model (TAM) has been found to be appropriate and effective.

Many factors contribute to the successful deployment of information systems projects. Türker et al. (2022) said even though a system may be successfully implemented in terms of technical requirements, an information system project is not considered successful if the technology is not used probably due lack of user acceptance or negative attitude to technology change. Therefore, end users' interest in terms of their needs and features that will encourage them to accept and use the system must be considered and built into the solution from the design, implementation, deployment and change management phases of the project Correa and Silveira (2023). Due to this, Amron and Noh (2021) noted that many researchers have investigated the factors that influence individuals to adopt and use information technologies or to reject and engage in sabotage or active resistance to the technology. The TAM on which this study is grounded explains this.

Analysis of Technology Adoption Model (TAM)

The TAM was developed by Fred Davis and Richard Bagozzi (Bagozzi et al., 1992; Davis, 1989). TAM is an information systems theory that explains the factors that motivate or guide the decision of technology users to accept and use technology. TAM posits that notable factors that influence system users' decisions regarding how and when they will use technology are:

Perceived Usefulness (PU)

Davis (1989) defined PU as the degree to which a person believes that using a particular system would enhance his job performance. This is the perception of the potential user about how the technology will enhance his results, whether the technology would be useful to what he wants to do, and whether it would improve his performance.

Perceived Ease-Of-Use (PEOU)

Davis (1989) defined PEOU as the degree to which a person believes that using a particular system would be free from effort. The easier a system is to use, the more people would want to use it. If a technology is not user-friendly, this will affect the users' positive attitude towards it. Since external factors affect people's attitudes, the environment and other social elements can influence the attitude and intention to use a technology.

Since new technologies come with their challenges, people form an impression about their use, the impression affects their attitude which culminates in behavioral intention prior to making efforts to learn and use the technology or otherwise. Bagozzi et al. (1992) pointed out that attitudes about a technology may be ill-formed as some negative attitudes may be a figment of imagination of the potential users, thereby affecting the actual usage, not reflecting the real robustness and usefulness of the technology. It must be stressed that intention to use will increase if the technology is easy to use, has a short learning curve and it improves users' performance. According to TAM, the higher the PU and PEOU of an information system, the greater the influence of users' positive attitude towards the system (Jo & Park, 2021). Therefore, their attitude

will in turn lead to a greater intention to use the system, which positively affects the actual use of the system. TAM establishes that the perceptions of usefulness, enhancement of job performance with increased productivity, and trust that the system will not introduce extra burden are the factors that influence end users' attitude towards the use and adoption of a system.

Enhancements of TAM

To address its limitations and ensure robustness, further studies to enhance TAM introduced external variables into the TAM model as an extension to TAM (Davis, 1989); this extension explored the effects of external factors on users' attitude, behavioral intention, and actual use of technology. Venkatesh and Davis (2000) and Venkatesh (2000) studied TAM and enhanced the model to TAM 2. Also, in their study, Venkatesh et al. (2003) enhanced the TAM to form the UTAUT. To optimize the TAM model, TAM 2 was proposed by Venkatesh and Davis; the UTAUT was introduced by Venkatesh et al. to explain how users form intentions to use an information system and their subsequent usage behavior. UTAUT differs from TAM by using behavioral intention (BI) leading to Usage Behavior in TAM 2 rather than the PU and PEOU by TAM. UTAUT theory posits that four constructs, performance expectancy, effort expectancy, social influence, and facilitating conditions, determine usage intention and eventual behavior of a technology user (Venkatesh et al., 2003). UTAUT emphasizes that social factors that influence individuals' attitude towards adopting a system. Furthermore, UTAUT theory states that gender, age, experience, and voluntariness of use are factors that moderate the impact of the four constructs on usage intention and behavior (Venkatesh et al., 2003). Also, TAM

2 introduced the concept of subjective norm: social environment impact on individual beliefs results in specific behaviors; other constructs such as voluntariness and experience are moderators to subjective norms, job relevance, output quality, and result in demonstrability (Stefanos et al., 2022). UTAUT constructs have similar properties to those of TAM 2, such as Performance Expectancy, which is defined as the degree to which an individual believes the adoption of new technologies will result in higher productivity (PU of TAM/TAM 2). Similarly, Türker et al. (2022) asserted that Effort Expectancy describes the ability to easily adopt and accept the use of new technology (TAM/TAM 2's PEOU); in this case, gender plays a significant role, Social Influence (as the name indicates) describes the extent to which the opinion of third parties can determine the final decision to use a technology. It has similar properties to those of the Subjective Norm of TAM 2 (Stefanos et al., 2022). According to Zhou et al. (2023), Social Influence (as the name indicates) describes the extent to which the opinion of third parties can determine the final decision to use a technology. It has similar properties to those of the Subjective Norm of TAM2.

Focusing on e-commerce as a formidable technology platform, TAM was enhanced to TAM 3 by including concepts such as the effects of trust and perceived risk on the use of e-commerce technologies (Venkatesh & Bala, 2008). The TAM provides understanding to why people choose to adopt or reject a particular technology and suggests the following conclusions about technology adoption (i) technology adoption is a complex, inherently social, developmental process; (ii) individuals construct unique but malleable perceptions or attitudes of technology that influence their adoption process;

and (iii) successful technology adoption must address cognitive, emotional, and contextual issues.

Some researchers have leveraged Davis's (1989) TAM model to provide empirical evidence on the relationships between usefulness, ease of use, and system use (Putri et al., 2023). While critiquing TAM principles, other researchers like Adams et al. (1992) tested and confirmed the validity and reliability of the questionnaire instrument used by Davis and his measurement scales. The internal consistency and replication reliability of the Davis's scales were tested and confirmed valid and reliable (Hendrickson et al., 1993) to support its use with different populations of users and different technology platforms.

Analysis of Rival Theories

It must be emphasized that apart from the TAM, various theories and models have been developed to address the concern of acceptance and adoption of new technology by end users. Some of the theories are theory of reasoned action (TRA), theory of planned behavior (TPB), innovation diffusion theory, UTAUT.

Theory of Reasoned Action (TRA)

The TRA explains the relationship between attitudes and behaviors within human action. The theory was developed by Martin Fishbein and Icek Ajzen in 1967, and derived from research in social psychology, persuasion models, and attitude theories. TRA seeks to understand an individual's voluntary behavior and the motivation for performing an action; the theory states that a person's intention determines his behavior or actions. Also, the social norms or normative elements surrounding action contribute to

whether the person will behave in the manner he does (Ajzen & Fishbein, 1980). In summary, the TRA posits that the intention to perform a certain behavior (Behavioral Intention) precedes the actual behavior and comes due to a belief that behaving or acting in a certain manner will lead to a specific outcome. TRA theory asserted that intentions are determined by attitudes to behaviors and subjective norms and that the stronger the intentions the more increased the effort to perform the behavior and the likelihood for the behavior to be performed (Pittalis, 2021).

However, TRA model has some limitations such as i. Significant risk of confounding between attitudes and norms since attitudes can often be reframed as norms and vice versa. ii. The assumption that when someone forms an intention to act, they will be free to act without limitation; in practice, there are violation controls to the freedom to act (Ajzen, 1991). iii. The TRA has difficulty accounting for situations in which one's behavior does not match one's intent.

In TAM model, the attitude measures of TRA were replaced with two technology acceptance determinants, PU and PEOU. Both the TRA and Technology Adoption Model are skewed towards behavioral attitudes since both agree that behavioral intention to act propels action without limitation. However, Bagozzi et al. (1992) concluded that this may not be the case in practice since there exists legal factors that limit human freedom to act.

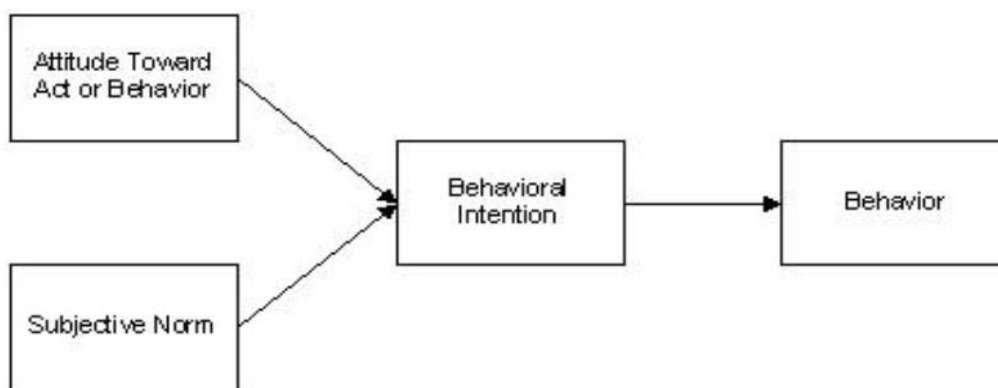
Theory of Planned Behavior (TPB)

To address the limitations of TRA, Ajzen and Schifter (1985) extended TRA by adding a third concept - Perceived Behavioral Control (PBC) thereby forming the TPB. TPB is considered one of the most influential theories in predicting and explaining

human behavior (Mohi-Ud-Din & Zhang, 2023). Many researchers confirmed the applicability of TPB to various domains, and that the model provided frameworks for explaining and predicting the acceptance of new technology (Nguyen et al., 2023). The TPB posits that behaviors are influenced by intentions to perform the behavior; and intentions are influenced by attitudes towards behavior, subjective norms, and perceived behavioral control.

Figure 1

Relationship Between Attitude, Subjective Norm, Behavioral Intension, and Behavior



Innovation Diffusion Theory

Diffusion of innovation (DOI) theory was developed by Gabriel Tarde in the late 19th century and Friedrich Ratzel and Leo Frobenius. The study of DOI started in the 1920s and 1930s due to the rapid advancement of agriculture technology as a result of which researchers examined how independent farmers were adopting hybrid seeds, equipment, and techniques (Wu et al., 2021). DOI concept explains how, why, and at what rate new ideas and technology spread. The DOI theory is a hypothesis outlining how new technological and other advancements spread throughout societies and

cultures, from introduction to widespread adoption. Pham and Nguyen (2023) argued that diffusion is the process by which an innovation is communicated over time among the participants in a social system, and proposed five major factors that influence the spread of a new idea as the idea or innovation itself, adopters, communication channels, time, and a social system. When a technology diffusion does not reach or approach 100% adoption level due to its own weaknesses, competition from other innovations, or simply a lack of awareness, it is considered a failed diffusion (Achuthan et al., 2020). This does not mean that the technology was not adopted, some innovations may fail due to the lack of local involvement and community participation.

Strategies for Adoption

Pham and Nguyen (2023) outlined some strategies to make an innovation reach adoption stage, this includes the impact on adoption when a highly respected and influential person adopts an innovation within a social network, this creates an instinctive desire for others to adopt the innovation. Another strategy includes injecting an innovation into a group of individuals who would readily use the said technology, as well as providing positive reactions and benefits for early adopters (Xiong et al., 2022).

Adoption is an individual process detailing the series of stages one undergoes from first hearing about a product to finally adopting it. Diffusion signifies a group phenomenon, which suggests how innovation spread. Parthasarathy et al. (2021) affirmed that although each study applies the theory in slightly different ways, this lack of cohesion has left the theory stagnant and difficult to apply with consistency to new problems. DOI theory explains that the way the manner and how quickly an innovation

is diffused or spread in the society is determined by how effectively the innovation is communicated to the society and the subjective norms associated with it. The concept of DOI theory may be applied by engaging respected and influential adopters as catalysts to consumer acceptance and adoption; also, the main players in the theory are innovators, early adopters, early majority, late majority, and laggards.

DOI theory establishes that innovation or technology adoption rates are different and depends on the type of society and the innovation itself. DOI also states that factors that affect the rate of innovation or technology diffusion or adoption by the consumers or end users include the society's population, its level of education, level of development and industrialization (Tang et al., 2022). For instance, a society may adopt the use of the internet faster and easier than automobile due to cost, accessibility, and knowledge of the technology and the rate of technological change.

Examples of DOI Theory

The DOI theory is extensively used to promote product use or adoption by marketers. The marketers seek consumers or end users who are passionate about the products; these are called early adopters who champion and testify about the benefits of a product to the public thereby encouraging others to use or adopt the product or service (Al-Rahmi et al., 2021). An appropriate example of this method is Facebook which was initially launched as a product targeted at students and educational institutions but later widely adopted on social media across the globe.

Criticisms of Diffusion of Innovation Theory

DOI has been criticized in many ways; diffusion is difficult to quantify because humans and human networks are complex to decipher what exactly causes adoption of an innovation since there are many forces acting as interplay on an individual and his or her decision to adopt a new behavior or technology (Xiong et al., 2022). The concepts of DOI theory is unable to account for all its variables, hence it is easy to miss critical predictors of adoption which has led to inconsistent results in research.

Pham and Nguyen (2023) placed the contributions and criticisms of diffusion theory research into four categories: pro-innovation bias, individual-blame bias, recall problem, and issues of equality. The pro-innovation bias believes that all innovation is positive adopted, this claim may not always be valid. It is also believed that diffusion may suppress the cultures and beliefs of another culture (Wu et al., 2021). Another weakness of DOI is its one-way communication from sender to receiver with a goal to persuade the latter which does not give room for feedback.

Based on the weaknesses of the TRA, TPB and innovation diffusion theory in adequately addressing the factors that influence technology adoption, the Technology Adoption Model (TAM) was propounded to address the weaknesses to extend its concepts and benefits

Application of Technology Adoption Model (TAM)

In this section of the study, I provided the application of the TAM constructs, PU and PEOU, and Attitude to address some real-life problems that are related to this study. Brar et al. (2022) used the extended TAM to ascertain and understand the acceptability of

a proposed, cloud-centric IoT-based disaster management system, by a specific set of users before the implementation of the system was completed. The study revealed that PEOU, Attitude, Behavioral Intention, Job Relevance, and Trust in the proposed system had significant positive impacts on PU and Behavioral Intention. The novelty of this study lies in the sense that the use of TAM model enabled the researchers to ascertain the acceptability of the proposed system prior to the completion of the system implementation. This prevented potential slippages in time and budget. Brar et al. used TAM to predict users' behaviors, addressed attitudinal issues and proactively formulated strategies to remediate the issues thereby ensuring technology adoption. Data were collected from respondents to the online survey via open-ended semi-structured interviews while data analysis was carried out using structural equation modeling; the results revealed that although PEOU and job relevance had significant impacts on PU, trust on the technology had an impact on the PU thereby providing a better understanding of the perceptions of users towards the adoption of the new technology.

Alyoussef and Al-Rahmi (2022) used the TAM to measure the adoption of big data to translate the adoption of big data into educational context. The study findings revealed that PU, perceived ease of use, facilitating conditions and perceived risk were important determinants of the attitude and behavioral intention of students to use big data. Also, the study reveals that 71.2% of acceptance was due to the positive attitude behavioral intention of students to use big data. TAM was used to understand the attitudes and intentions of the students that influence positive technology adoption. The application of TAM to this study underscores the project managers' technological

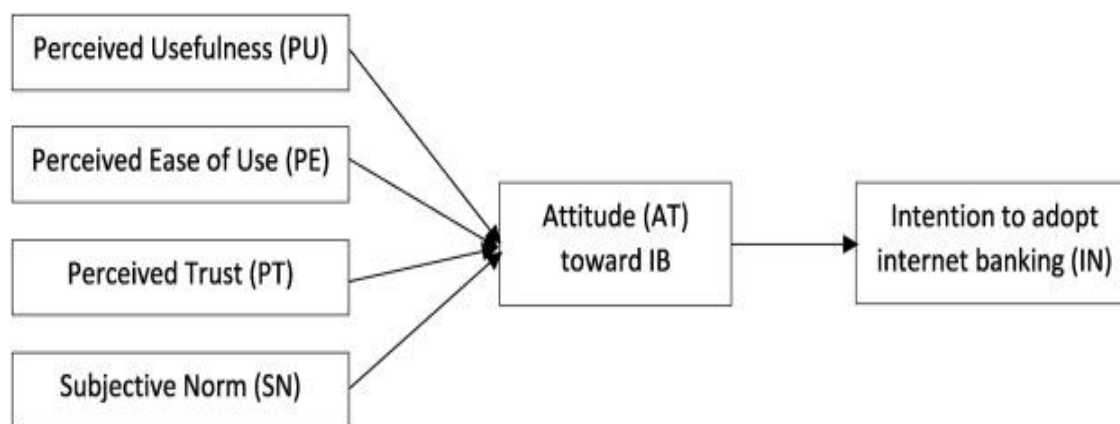
behavior, in relation to seamless adoption of e-government service delivery. The study which was conducted through qualitative data collection from 282 university students used the structure equation modelling for data analysis identified seven themes grouped into constructs to understand the students' adoption influence (Alyoussef & Al-Rahmi, 2022). Data collected from the participants helped to determine reasons to adopt the technology, thereby culminating in the success of technology.

Based on the principles of e-commerce, using internet banking to access financial services remotely was convenient and beneficial during the COVID-19 pandemic. Therefore, Ly and Ly (2022) sought to understand the factors behind mobile banking adoption to maximize its use. The qualitative study used questionnaires to collect and analyze data using the TAM as conceptual framework, the results confirmed that perceptions of trust and usefulness are the critical determinants of attitude towards the use of internet banking technology and intention to adopt the technology. Also, it was concluded that PU significantly positively impacted attitude towards the technology. This is consistent with previous studies that claimed that PU substantially influenced attitude towards mobile banking (Ly & Ly, 2022). The perception of getting the desired outcome motivated people to use technology. This indicates that in line with the TAM model, individuals are encouraged to use technology when perceived as beneficial. Secondly, the study confirmed that perceived trust in technology was the most influential construct on positive attitude. This is in line with what Sholikah and Sutirman (2020) pointed out that trust significantly affected attitudes towards technology adoption. Trust provides users confidence that their data and online transactions are secure, and their privacy is

protected, their funds will be reimbursed to the appropriate merchants. In this study, the application of TAM helps to determine the above constructs that builds users confidence and raises the attitude to use the system.

Figure 2

Relationship Between PU, PE, PT, and SN Leading to AT and IN



Also, it was found out that that subjective norm had a significant and positive impact on AT toward the use of the technology; this is in line with previous studies that Subjective norm has influence on actual behavioral intentions (Zobeidi et al., 2023). showing that users are conscious of their social environment thereby accepting the use of the technology as a norm. Therefore, TAM specifies that social expectations are a strong factor that influences adoption of a technology.

Stefanos et al. (2022) noted that although the TAM frameworks have been tested and adopted in Western nations, very little effort has been made to ensure their application produces positive results in Africa. Since technology is a global phenomenon certain additional constructs to TAM especially in terms of cultural inclinations and local imperatives may be necessary for the model to be globalized. The implementation of

strategies consistent with TAM to propel solutions designs that incorporate the Nigerian local environmental narratives and citizens' requirements to promote adoption and success rates of e-government systems.

Criticisms of TAM

Despite its benefits and wide use, several criticisms have trailed the TAM thereby resulting in various upgrades and extensions of the model to make it better. One of the criticisms of the TAM is about its nonrecognition of individual differences (Kaur & Kaur, 2022) since beliefs and attitudes about technology can be influenced by more than PU and PEOU of the technology. Also, the original TAM did not take into consideration prior experience, age, gender, and other attributes that may influence attitudes which in turn influence intention to use an information system.

One of the criticisms is against presenting TAM as a "theory", and that its heuristic value is doubtful; the "theory" is impracticable, unexplanatory, and trivial. Alshurideh et al. (2023) asserted that TAM "has diverted researchers' attention away from other important research issues and has created an illusion of progress in knowledge building. Other researchers claimed that TAM has introduced confusion and chaos due to independent attempts by researchers to expand principles and adapt them to the constantly changing IT environments (Ishola et al., 2021). TAM has been criticized as having focused mainly on the concept of individual users' "PU" and "perceived ease of use" and variables to measure how a user "perceives" "usefulness"; however, it ignores social perspectives of technology and neglected whether the technology is actually better, and the social consequences of the information system (Yao et al., 2022). Lunceford

argues that the framework of PU and perceived ease of use overlooks other important elements, such as cost and factors that compel users into adopting the technology.

Limitations of TAM

Decisions to roll out a new technology are often made by top-level executives in corporate organizations, learning institutions, and governments, hence the use of such information systems could be mandatory. Therefore, the factors that affect the adoption and use of technology in a mandated environment may not be appropriately determined since TAM does not give a true and realistic measure of technology acceptance where the individuals ultimately do not have a choice to form their own attitude and to exercise their own intentions to accept and use a technology (Wang et al., 2022). Future study is required to ascertain different levels of voluntary behavioral influence for the acceptance and use of technology.

Diverse factors influence choice, adoption, and use of a technology however, controlling any of the technology adoption constructs will not guarantee success even if the technology is the most useful, therefore TAM will not produce the desired result in an environment where any of its contextual constructs are controlled Aria and Sacco (2023). Technology adoption is inherently complex and socially inclined, it is influenced by peers, change agents, organizational pressure, and societal norms (Habes & Pasha, 2021) which TAM concept did not cover and address.

Application of TAM to This Study

From the above, TAM postulates that PU and PEOU are factors that influence system users' decisions on how and when they will use technology (Davis, 1989). PU is

the perception of potential users about how the technology will enhance their job performance, whether the technology would be useful to what they want to do, and whether it would improve their performance. PEOU explains that the easier a system is to use, the more people have a positive attitude to use it. Therefore, it is imperative for the Nigerian government IT project managers to be able to decipher the factors that influence stakeholders' or users' attitudes and perceptions toward the use of technology and leverage this knowledge to ensure the success of e-government projects in Nigeria. The Technology Adoption Model (TAM) is used in this study because TAM adequately explains the factors that motivate or influence the decision of technology users to adopt and use a technology. Therefore, TAM theory is relevant, perfectly fits, and applies to this study in explaining, articulating, and grounding this study to explore the strategies for implementing e-government projects in Nigeria.

Most IT project managers seem to concentrate their efforts primarily on meeting the system design and other technical aspects of e-government implementations based on their own perspectives as service providers, little or no attention has been paid to satisfying the citizens' or end users' requirements to foster technology acceptance and adoption. Therefore, the increasing e-government project failures seem unabated while government revenue loss continues to worsen. This, among other things, is a major gap in e-government project preparation, implementation, and deployment; and the concept of TAM, PU and PEOU will be used in this study to adequately address the adoption gap, among other factors, in formulating the strategies for implementing e-government projects in Nigeria.

E-government services, most of which are personalized services, are important and widely used; additionally, the digital platforms are mostly used for exchange of sensitive personal, state or national information and financial transactions. Therefore, users are concerned about the consequences of possible data breaches and compromise of their sensitive information resulting in agitations affecting the acceptance and use of e-government systems in Nigeria. TAM model explains the nuances pertaining to technology adoption through its concepts, PU and PEOU of technology while extended TAM introduces security nuances such as information privacy and trust particularly from technology end users' perspectives rather than from the technology implementers or service providers' perspective. Based on this, the TAM applies to this study in that TAM concept will be used as a guide and leverage to incorporate features to earn users' trust and ensure privacy to build end users' confidence and positive attitude towards e-government adoption in Nigeria.

Application to the Applied IT Problem

Synopsis of Government Projects

Technology innovation has transformed the world and enhanced the sectors of various economies (Jayaprakash & Pillai, 2022). Having realized the tremendous benefits and transformation that technology could bring to its economy, the FGN provides annual budgets for deliberate investments in e-government technologies to transform the country into a digital economy (Paul & Adams, 2024) to improve public service delivery, enhance efficiency, and bridge the gap between the government and the populace. However, despite the huge investments made, many of the e-government projects in

Nigeria suffer from abysmally low patronage, poor utilization, and adoption (Eja & Ramegowda, 2020) due to a wide design-reality gap among other factors (Omohwovo et al., 2020). It is either the awarded projects are not implemented at all, while others that were implemented were not successful or failed shortly after go-live thereby resulting in total or partial failure (Aziz et al., 2023). According to Heeks (2002), design-reality gap is the shortfall between a system design expectation and its implementation realities. Choi et al. (2016) noted two critical stages in e-government projects: the reality stage, “where we are now” and the design stage: which states and defines the future goals of the e-government project, “where the e-government project wants to get us”. The smaller the gap between the two stages, the higher the probability of e-government project success; the wider the gap, the higher the probability of failure. Correa and Silveira (2023) who corroborated the above fact that many e-government projects designed to be robust information gateways between the government and citizens have been abandoned.

Many e-government systems in Nigeria experience low patronage because the systems are not useful or useable; while they come with features commonly available on the e-government platforms designed and developed in advanced countries, the systems are grossly deficient of the features of Nigerian local peculiarities, therefore hampering user engagement not meeting their needs. An e-government system is not useful or useable when it experiences poor user interaction, this could be due to design errors in defining its elements such as modules, architecture, components, and their interfaces including data types, sources, and data manipulation, thereby resulting in non-alignment with the specified user requirements (Wilson, 2022).

Design error culminates in system development inefficiencies leading to unsatisfactory results. Development inconsistencies ensue when the design set of rules, structures and other business requirements of the e-government system are compromised during implementation process (Arslan-Ari et al., 2018).

To achieve useful and usable e-government systems require a systematic approach for a coherent and well-articulated design and development processes (Wilson, 2022). Therefore, e-government system designers and developers must gain thorough understanding of users or customers' requirements. Ensuring user-centric designs that guarantee system alignment with end-user needs and business goals is imperative in developing robust and flexible e-government systems. Krauss (2022) listed common design errors emanate from partial understanding user needs, design based on assumptions, failure to test the design before proceeding to development stage, and not paying attention to elements of system usefulness and usability.

Other factors responsible for the failure of e-government projects embarked on by the Nigerian government are factors hampering technology adoption such as poor technology literacy level of the end-users (Omohwovo et al., 2020), long learning curve, lack of adequate user and technical training, inadequate public enlightenment, epileptic electricity supply leading to incessant downtime of the e-government platforms and inaccessibility of the platforms due to technical glitches, paucity of internet facilities especially in the rural areas; where it is available, the internet is unstable and many citizens are unable to afford it due to high poverty level (Okunola & Rowley, 2019). All these factors among others affect users' perception and attitude towards the adoption and

use of e-government systems in Nigeria. Other factors apart from technology adoption challenges affecting the success of e-government systems in Nigeria are poor planning, improper scope definition, weak risk analysis, poor project management strategy, bribery and corruption, budget slippage, frequent changes in government policies, engagement of incompetent consultants, and more.

According to the Project Management Institute (2021), a project is a temporary endeavor aimed at creating a unique result to be accomplished at a set time, budget, and agreed specifications. Therefore, project failure ensues when a project does not meet its set parameters such as the agreed timeline, budget, and scope; Correa and Silveira (2023) added that an information systems project is classified as failed when the system is not used, for instance due to improper user adoption, even though it is fully implemented and live. Also, Jayaprakash and Pillai (2022) validated this argument that regardless of a project's completion time, cost, and scope, it can be considered as failed if it does not fulfill its planned purpose or meet business requirements.

In his investigation of the causes of e-government projects failures in African countries such as Nigeria, Sausi et al. (2021) noted that less than 10% of the causes of information systems (IS) failures are technically related, greater than 50% of causes of project failure are people-related issues while others are due to infrastructure deficit coupled with local and environmental peculiarities not adequately addressed in the solutions design, deployment, and change management. A major factor often overlooked by IT leaders and project managers in e-government systems implementation plans is people management in terms of ameliorating the challenges encountered in transition to a

new technology thereby resulting in failure. To create a smooth and stress-free transition to a new system, it is imperative to incorporate technology acceptance and adoption strategies in e-government design, development, implementation, and post go-live plans. If users perceive the change as not enhancing their job performance or the solution is difficult to learn, they will resist the change (Davis et al., 1989). This will lead to low adoption since the technology is not useful and useable; to ensure seamless acceptance and adoption of a new technology, IT project managers must reevaluate their design and development strategies and change management practices to deploy useful and useable e-government systems.

Steps to Improve Technology Acceptance and Adoption by End Users

Adequate User Information and Awareness

Technology changes can be challenging and cause uncertainties resulting in anxiety and inertia from the users (Altalhi & Basiouni, 2022). To encourage technology adoption, adequate awareness and education of the target users are essential. Creating necessary awareness and training helps the users to be familiar with the system thereby enhancing positive perception of its usefulness (PU) and PEOU using the TAM concept. A clear purpose and advantages of the e-government system should be defined and how it will enhance users' job performance and increase productivity should be explained. The TAM is a potent and widely used tool to educate the users on the new technology (Davis, 1989; Davis et al., 1989; Venkatesh & Davis, 2000). Therefore, evolving strategies to inform users why it is useful and how it is easy to use is vital for getting them accept, adopt, and use the technology (A. Li & Xu, 2020)

Effective Communication

Maintaining simplicity in communicating the definition and presentation of the usefulness and ease of use of the new e-government system is key to positive adoption. Using technical jargon and other languages too hard for the populace to understand is ineffective, adapting the communication of the new technology to be simple easily to understand and fit for the target audience fosters adoption and use of the technology (Cahn et al., 2023).

Although the communication accommodation theory (CAT) has typically been used to help facilitate increased understanding in cultural settings, it is also used in organizational communication (Voss et al., 2021). The FGN should consider the multi-cultural nature of the country, the skill set, knowledge, and literacy level of the citizens to draft communication channels and media suitable for each segment of the populace whether in print, audio or audiovisual media in a way that the information can be comprehended by different audience (Maden et al., 2020). Simple and clear communication materials, articles, information guide or training documents to simplify the use of e-government systems should not be potentially offending to the public (Zhang & Kamargianni, 2023). With e-government benefits to the users clearly stated in a way they can understand, coupled with clear purpose statement, its usefulness and ease of use, this will increase the public trust to form positive attitude to accept and use the technology (Olatunde et al., 2021).

Influence

DOI theory enumerates the process by which an innovation or product diffuses through a social system (Zhang & Kamargianni, 2023). DOI theory posits that influencers, who are respected public figures, be made champions for innovation and be used as catalysts to prompt the adoption of new technologies (Cahn et al., 2023) in line with TAM concept. It is believed that when influencers recommend or approve of a technology, many will follow suit. In this case, government and IT project managers should collaborate to identify respected influencers in society and include them in the decision-making process from the beginning of the project to gain public and other stakeholders' buy-in to the new technology. This will improve technology acceptance and adoption (Voss et al., 2021) in line with TAM.

Specific challenges affecting e-government adoption in Nigeria were further emphasized by Okunola and Rowley (2019) who asserted that Nigeria is one of the developing countries with increasing failed e-government projects because many citizens (end users) do not have access to reliable electricity supplies and internet connectivity coupled with privacy issues, and low computer literacy level. According to the 2021 World Bank Development Report, more than 50% of Nigeria's population do not have digital skills and therefore cannot use computer system. According to Ofoma (2021), Although an e-government system may be successfully implemented and go live, the system could be abandoned due to dogmatic implementation of "imported" system designs from developed countries without considering the Nigerian local realities. This makes the system unusable due to widened design-reality gap and scope creep.

Omohwovo et al. (2020) buttressed this point that the failure rate of e-government projects in Nigeria is high, due to the design-reality gap, and further emphasized that there must be a deliberate introduction of local requirements improvisations in the project design and development phases to reduce the design-reality gaps (Sampson et al., 2022). Design-reality gap is the difference between the current state of the system and the system to be implemented; the wider the design-reality difference, the higher the project is prone to fail while the probability of success is high with a low design-reality gap (Hua, 2022).

Another major cause of e-government project failure is that the Nigerian government IT project managers often adopt “imported” information systems (IS) designs from developed countries where virtually everything works without considering Nigerian local realities (Mahlangu & Ruhode, 2020). Therefore, adapting the often-imported information systems designs to reflect the Nigerian local realities and peculiarities will increase the success rates of e-government projects (Samsor, 2020). Research has shown that there are many more causes of e-government project failure in developing countries (Aziz et al., 2023), the resultant effect of which is poor end-user satisfaction coupled with low adoption; to curb this requires a thorough investigation into the root causes and effects of projects failure.

Eja and Ramegowda (2020) discovered that the consequences of e-government project failure in Nigeria lead to the increasing spate of retarded economic growth, loss of confidence in the country by the neighboring and international community, general

underdevelopment, and low people empowerment, especially the youth who are being recruited as political thugs, banditry, insurgency, and insecurity.

E-Government Project in Africa: Trend, Success, and Failure

Execution of e-government projects requires huge capital outlay to ensure the projects deliver value, implementation must entail the application of best practice tools, methods, and skills to achieve the project objectives; therefore, designing and developing e-government systems with conscious adherence to systematic and organized systems processes and design-reality model (Mahlangu & Ruhode, 2020) will guarantee high success rate (Suryaatmaja et al., 2020). The persistent e-government project failures will have far-reaching adverse effects on the Nigerian economy and its populace. Apart from the loss of money, failed public sector technology projects jeopardize economic growth, hamper trade, and tourism, cripple efficient information flow, and lead to unemployment (Sausi et al. (2021). Failed e-government projects destroy the opportunity for knowledge building for new technologies thereby hampering skill acquisition potentials for the citizens. Unchecked e-government project failures encourage bribery and corruption by public officers as project contract awards could become conduit pipes for embezzling public funds thereby subjecting the country to underdevelopment and subjugating its citizens to abject poverty (Olatunde et al., 2021).

Failure of e-government projects is not limited to only Nigeria, it is a global phenomenon; however, its magnitude differs from country to country (Kubuga et al., 2021). The success rate in the developed world is significantly higher than in developing countries. In Africa, for instance, the Tanzanian Mwananchi portal, an e-government

platform designed to create an information gateway between the Tanzanian government and its citizens was launched in 2009. The project, which was revamped in 2014, was abandoned due to failure (Sausi et al., 2021). In South Africa, Revenue Management System (RMS) project designed and developed by the eThekweni Municipality commenced in 2003, the project which lingered for 13 years was completed in 2016 with project timeline slippage and budget overrun of 666% of the initial cost (Antony et al., 2022). It was concluded that inadequate system requirements specifications amongst others were the main causes of its failure. Also, the Uganda Management Institute's (UMI) student information system failed due to anomalies in the project scope definition of its finance module Sausi et al. (2021).

In Nigeria, government project failure seems to be the norm rather than an exception (Okunola & Rowley, 2019); according to Lawan et al. (2020), 25% of projects succeed, 45% are challenged (late, budget over run, and/or with fewer than the required features and functions), and 18% fail (either canceled prior to completion, never completed, or delivered and never used). For large projects of more than \$10 million, the average project success rate is 10%, challenged projects are 52% (due to lateness, budget overrun, and/or with fewer than the required features and functions), and 38% fail (either canceled prior to completion, never completed, or delivered and never used) (Olatunde et al., 2021).

According to the Chartered Institute of Project Managers of Nigeria (2022), in the Vanguard, and This Day Newspapers, over 56,000 projects worth NGN15 trillion (USD 2.9 billion) are abandoned in Nigeria. It further explained that poor financial

capacity, inaccurate costing and corruption, incompetence, and poor contracting and contractor practices are among the reasons for project failure. The consequences have resulted in slow economic growth and wasted resources.

To achieve its economic development plan, the Nigerian government executes laudable projects which are usually financed with IMF and World Bank loans. The projects which include the construction of rail lines, major roads, airports, community electrification, e-government, telecommunication, and ICT, among others face setbacks such as abandonment (Ebekozi et al., 2023), cost overrun (Osah & Pade-Khene, 2020), delivery timeline slippages, anomalous scope definition (Muhammad & Hromada, 2022), lack of stakeholders' buy-in (Ajadi et al., 2021), and disregard to inculcate the Nigeria local peculiarities in the project design. For instance, the National Identity Card project implemented by the National Identity Management Commission (NIMC) which started in 2007 has not been completed to date, about sixteen years after; this is due to improper planning, inadequate risk analysis, incompetent partners, poor project management, lack of continuity as government regime changes, etc. The NGN3.8 billion (US\$8 million) technology projects executed by Abuja Investment and Property Development Company (AIPDC) in Nigeria experienced failure. Also, the National Virtual (Digital) Library projects for the Nigerian tertiary institutions were initiated by the FGN through the National Universities Commission (NUC), the Federal Ministry of Science, Technology, and Innovation (FMSTI), the UNESCO Virtual Library Pilot Project, Xlib and TINLIB project and so on experienced setbacks, majority of the E-libraries are non-existent while those existing are sub-optimally functional. Shenkoya's

(2023) study revealed that the electronic library project has remained on paper as it never saw the light of the day after several years of implementation. Other projects aimed at creating research centers in the country were the National Research and Education Networks and Research Library Consortia (Shkarlet et al., 2020) suffered a major setback with few successes. The findings from the study revealed that most of the projects were not implemented by the project owners who conceived the vision (A. Mustafa et al., 2020).

E-Government Projects in Nigeria: History, Success, and Failure

The menace of e-government project failure and its repercussions were adversely affecting the Nigerian government's public service, hence the need for a reform. In its reform and to bring sanity to the decaying public service system, the FGN took a strategic decision to digitize the public service by designing and developing useful and useable e-government systems based on which the FGN enacted the National Information Technology Policy through which it established the National Information and Telecommunication Development Agency (NITDA) in 2001. The objectives of NITDA were to oversee, monitor, and control the implementation of public sector IT and e-governments systems in line with best practices. NITDA's role is to digitalize public services and processes to foster efficiency, transparency, accountability and to reduce corruption in public offices while bridging the widening gap between the government and its citizens. Although some government services can now be accessed online, the project success rate is still low compared to the investment committed to it (Ajadi et al., 2021) due to design and development anomalies resulting in poor end-user engagement and widening design-

reality gap. To give credence to its drive towards a digital economy, the government later established Vision 20:2020 (NV20:2020) the country's long-term development plan designed to position Nigeria in the league of the top 20 economies of the world by the year 2020 with e-government as one of the major drivers for the Vision 20:2020

E-government is the deployment of ICT tools to bring government services closer to the citizens for better governance. Samsor (2021) described e-government projects as the use of technology and internet facilities to transform and present government's operations, structures, and culture to the citizens thereby ensuring commitment to good governance. The World Bank (2020) defined e-government as the government-owned or operated systems of ICTs that promote government-citizens relationships (individuals, businesses, and government agencies) to empower the people, improve service delivery engendering accountability, transparency, and improve efficiency in governance (Al-Sayegh et al., 2023).

Osah and Pade-Khene (2020) confirmed that e-government has helped governments globally to improve public service fostering responsiveness, accountability, building public trust and confidence, and national transformation enabling collaboration between citizens and governments at the local, state, and national levels. Ly and Ly (2022) argued that governments worldwide are taking initiatives to deploy e-government machinery to institutionalize transparent, responsive, and inclusive governance collaborating with citizens, and reducing the costs of governance. Some of the services rendered to the public through e-government platforms include applications for marriage certificates, birth certificates, building permits, business licenses, death certificates,

driver's licenses, identity cards, environmental permits, land title registration, visa application, online payment for taxes, utility bills, and many more (Olawumi & Chan, 2022).

However, despite the government's commitment and investment towards making Nigeria a digital powerhouse, e-government acceptance and adoption have been stunted due to the Nigerian government IT managers' lack of strategies for designing and developing useful and useable e-government systems resulting in low user interaction with the system and poor adoption by the citizens. Therefore, deliberate efforts must be made to bridge the design-reality gap (Arslan-Ari et al., 2018) hampering e-government project success. This fact is evidenced by the report of the recent 2022 United Nations e-Government Ranking and Assessment in which Nigeria's position was 140th out of the 193 United Nations Member States with the following breakdown: out of 1, Nigeria ranked 0.4521 on Global Development Index, 0.4439 on Human Capital Index, 0.525 on Online Service Index and 0.3886 on Telecommunication Infrastructure Index (United Nation Department of Economic and Social Affairs, 2020). In comparison with other developing countries in Africa, Nigeria is not making commendable progress in its e-government projects. This is due to widening gap between the current state of the system and the planned desired point already designed, lack of strategies for implementing e-government projects and other factors such as low level of acceptance and adoption of e-government service delivery projects by the citizens, and non-conformity to the best practices in the implementation standard adopted by the government. The cost of these failures is staggering, with estimates ranging from \$50 to \$75 billion annually.

Challenges of E-Government Projects in Nigeria

A. Mustafa et al. (2020) noted that despite the enormous advantages of e-government, there are significant challenges affecting its growth in Nigeria. E-government challenges span both technical and non-technical aspects in the conception, design, deployment, and adoption of e-government systems (Omohwovo et al., 2020). Research has shown that e-government implementation in Nigeria is plagued by several factors such as the digital divide and corruption (Apeloko et al., 2020). In her interview, the African Union Commissioner for Infrastructure and Energy, The International Telecommunication Union (ITU)/UNESCO (2020), explained the challenge of digital divide that nearly 300 million Africans live without a fiber or cable broadband connection, hence the lack of internet remains a significant hurdle for Africa to fully harness digital transformation.

Similarly, Oke et al. (2023) pointed out that ICT infrastructure deficiency and low IT literacy are challenges facing e-government in Nigeria. Lack of stable and clean power and electricity supply Monye and DeKoker (2022) particularly in Africa is a major reason for poor implementation and usage of e-government. According to Ebekozi et al. (2023), Government is reluctant to share information to aid the smooth implementation of e-government, this accounts for the high rate of e-government failure while Unegbu et al. (2022) raised concerns regarding privacy and security of data, and that weak legal frameworks and uncertain regulation to prosecute cybersecurity criminals encourage the abuse of privacy of e-government users and lack of comprehensive e-government design and development strategy.

Transition and Summary

Section 1 of this research itemizes the purpose of this study and reviews the background to the research problem with a detailed overview of the foundation of the study. The section includes the purpose statement, nature of the study, research question, interview questions, conceptual framework, and a review of the professional and academic literature. The literature review provides a background for the study ensuring strategic alignment of the specific information technology problem with the research question and purpose statement. This study was conducted with qualitative research methodology and pragmatic inquiry design as the best approaches to answer the research questions and form strategies for implementing e-government projects in Nigeria. In this section, the Technology Adoption Model (TAM) was used as the conceptual framework providing a foundation to explain and ground the relationships between TAM and the specific research problem phenomenon. The literature review includes the overview of TAM and how its concepts, PU and PEOU, apply to this study to facilitate technology adoption.

Section 2 includes a more detailed discussion of components such as the research participants, sampling procedures, research methodology and design used, including justifications for using the qualitative method and pragmatic inquiry design. Also, Section 2 contains ethical requirements and boundaries to protect the participants in compliance with the requirements of Walden Institutional Review Board (IRB). I describe the data collection and analysis methods including the conditions and methods used to ensure data reliability and validity.

Section 2: The Project

Purpose Statement

The purpose of this qualitative pragmatic inquiry study was to explore the strategies used by the Nigerian government IT project managers to design and develop e-government projects in Nigeria. The targeted population for this research comprises of FGN's IT project managers who deploy e-government projects for government institutions in Lagos State of Nigeria and having strategies for designing and developing useful and useable e-government systems with skills to increase e-government system adoption.

The findings from this study may potentially contribute to positive social change by providing effective strategies and standardized mechanisms to guide the successful design and delivery of e-government projects in Nigeria thereby increasing the success rates; to boost government revenue, enhance cost reduction resulting in economic growth. Also, this study may contribute to positive social change by enhancing the knowledge of the FGN IT project managers and technology researchers; e-government services may benefit Nigerian citizens by improving e-learning, easy access to online government services, bridging the gap between government and the citizens, and providing employment opportunities leading to a better standard of living for the Nigerian population. Also, highly robust, and flexible e-government systems that are found useful and easy to use by the citizens will enable easy online services thus enhancing the quality of citizens' lives while providing options.

Role of the Researcher

As the researcher in this qualitative pragmatic inquiry study, I was the primary data collection instrument, and my role included data collection. I gathered and collated data from the research participants (Sigurdardottir & Puroila, 2020). This involved gathering high-quality data from many sources including face-to-face and online semi-structured interview with open-ended interview questions, observations, and approved documents from public domains. I gathered, reviewed, organized, and interpreted the data and analyzed and collated them to form meaningful themes. The interview questions were crafted to align with the research problem to probe and prompt the participants for detailed responses. I managed the research process by scheduling interviews, administering the interview questions to each interviewee without being interrogative. I observed and listened attentively while jotting down notes, and I was not judgmental (Hoar et al., 2022).

The participants were randomly selected from the pool of qualified and experienced government IT project managers who had been involved in deployment of e-government systems in the last five years in Nigeria with skills to design and develop useful and usable technology solutions and preference for system adoption. The selection of participants and data gathering processes were strictly aligned with the requirements and research protocols of the Belmont Report issued by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (Belmont Report) (1979), which I used as a pivot for moral and ethical guide in this study. The Belmont Report specifies research protocol and principles into three

major categories which are Respect: for participants' opinion and choice, Beneficence: the researcher should care, protect, and defend research subjects from risks, and Justice: provide equity and fairness to participants (Hagues, 2021). The report specifies ethical guidelines on securing the voluntary consent of participants before their involvement in research, protecting the privacy and identity of participants, and the information volunteered by participants (U.S. Department of Health and Human Services, 1979). I strictly complied with the protocols of ethical standards throughout this research study. In addition to Belmont protocol, I leveraged Walden University guidelines for selecting and treating research human subjects as follows:

I treated the research subjects with respect and as autonomous agents thereby participants' opinions and choices were honored. I did not withhold the information necessary to make their independent judgements and opinions. Since the ability to understand an information depends on intelligence, rationality, maturity, and language (Ochieng et al., 2022), I adapted my presentation to the subjects' capacities, by presenting information in a simple language that participants understood and I gave them opportunity to ask questions, to ruminate over the tasks and to voluntarily decide their participations or otherwise. The information about risk to subjects was shared to ensure they were adequately comprehended. According to Vega et al. (2020), respect requires that the researcher should give the subjects the opportunity to choose whether to participate in the research, and their objections to participation should be honored without prejudice (Murray & Irlbeck, 2020). I informed the research subjects that participation was voluntary, they could join, participate, and withdraw any time during

the cause of the research; they had freedom to ask questions at any time about the research. In this study, I obtained the informed consent of each participant. Tubig and McCusker (2021) affirmed that coercion occurs when deliberate threat or harm is made to a potential participant to enforce compliance or participation while undue influence could be through the offer of inappropriate reward. Based on this, I ensured that no participant was forced, coerced, or lured to participate in this research; I ensured that participation was voluntary. Adequate information disclosure about the research procedure, participants' purposes, and anticipated benefits was made to the participants to assure them that research subjects could make decisions regarding the research.

The criteria for selecting participants were based on equality and fairness while participants' responsibilities were clearly spelt out. Information about the research risk was not withheld for the purpose of eliciting the cooperation of subjects. Participants will be treated in an ethical manner in terms of respect for their decisions and protection from harm and securing their well-being. I did not have undue advantage or influence on the research subjects selected due to my position or offer them money, reward, inducements, or any overtures for them to participate; I ensured that the research subjects offer themselves on their own volition and because of their interest in being agents of change by finding solutions to the research problem being studied. Ochieng et al. (2022) said that information should be conveyed to research subjects in a comprehensive and understandable manner since presenting information in a rapid and disorganized manner, allowing too little time for the subjects to ruminate and consider

their decision and actions or curtailing opportunities for questioning, may adversely affect a subjects' ability to make an informed decision (Murray & Irlbeck, 2020).

Rodríguez-Gómez and Moreno (2023) confirmed that researchers use interviews as tools for information gathering through interview questions to expound the research topic. I conducted interviews to seek the participants' experiences, expertise, viewpoints, and advice on the research topic. The credibility of a qualitative research study will be doubtful if data integrity cannot be guaranteed (Kekeya, 2021). Based on this, I observed interview protocols by asking non-leading questions that allow the respondents to give answers in a specific way leading to the results I want since that could weaken the validity of the results. Petrus (2022) reinforced that qualitative researchers use semi-structured interview protocols to capture rich, valuable information from participants by allowing them to discuss their personal experiences with a phenomenon. The interview process aimed at getting effective strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government projects. During the interviews, I first introduced the topic to the participants after which the interview questions followed to get an understanding of their perspectives. (Yin, 2018) advised that a properly administered interview protocol with skillfully drafted interview questions that address the problem phenomenal will provide the appropriate answers to the research questions. I used an interview protocol that consisted of (i.) simple, open-ended interview questions. (ii) succinct probing questions. (iii) follow-up questions to clarify the participant's previous answers (iv.) fieldwork notes and observations by the researcher. Also, I treated all participants equally and fairly by asking the same set of

questions. To avoid bias, I ensured that the interviewees were not interrupted, and I did not interject them while they were responding to the questions. I used an interview protocol for my interviews for this study (see Appendix A).

I have more than 25 years' experience in information technology practice in the financial industry in Nigeria. I have been a team member in several project spanning software, networking and information security designs and development; I have been involved in the implementation and support of small, medium, and large projects in core banking application, Enterprise Resource Programs (ERP), human resource management systems, network and cybersecurity projects, disaster recovery and business continuity plan. As a solutions provider, I am involved in formulating and implementing IT strategies with deliberate alignment with the corporate strategy. I have been project team lead at various times in information systems integration of three different mergers and acquisition of small, medium, and larger sized commercial banks approved by the Central Banks of Nigeria. Also, I have been directly involved in various project management roles of hardware and software solutions integration, enterprise network upgrades including selection process and migration of systems from on premise to the cloud platforms. I focus on configurations and performing tuning, systems optimization, troubleshooting, conducting root-cause analysis to isolate the exact cause of system problems while proffering solutions to complex technical faults. Apart from these, I am involved in drafting, implementing, monitoring and evaluation of information systems and information security policies. My experience and exposure at systems design, development, implementation and support intricacies, risk assessment and controls,

effective collaboration with service providers, internal and external stakeholders have engendered success in my IT projects thereby serving as a motivation for this study to find effective strategies for implementing e-government projects in Nigeria to boost government revenue.

Elmersjö and Rosqvist (2022) cautioned that a researcher's knowledge and experience in a research problem may influence his data collection, coding, and overall data analysis which may result in biased results. Despite my experience in information technology and project management, I made deliberate efforts during this research study not to allow my preconceived ideas or notions to becloud and influence me since this could result in bias jeopardizing my research results. Although Dragga and Voss (2020) confirmed that the experience of a researcher practicing in the field of research could constitute a bias due to self-reflexivity, I avoided biases by documenting sources of potential biases so that the research results are authoritative. Hamilton et al. (2023) enumerated the benefits of taking field notes, verifying of facts or data from the sources including human subjects coupled with audio and/or video recording of participants during interviews or data collection process. I took field notes and recorded all the interview sessions to ensure that I captured all the information as provided and avoided bias. I did member checking allowing each participant to confirm the correctness of data collected from them. This was to eliminate preconceptions or biases that may influence the results of the research. A researcher must mitigate any bias that could potentially affect the quality of data collected and analyzed (Murray & Irlbeck, 2020). I used open-ended interview questions that did not provide leading questions or influence the

interviewees' responses to a preconceived conclusion. This will be deliberately used to avoid bias during the interviews.

G. O'Sullivan et al. (2020) explained that researchers' preconceived notions or biases could be addressed with the use of bracketing; therefore, I used use bracketing to ensure my preconceived ideas did not constitute a bias in this study. Also, I did not have prior personal or professional relationships with any of the participants, therefore they do not owe me any obligation for them to be biased.

Participants

A researcher must purposively define the metrics for determining the eligibility and for selecting qualified research participants who can provide correct unbiased answers to the research questions (Marshall et al., 2022). Since experienced and capable participants provide more depth about a phenomenon, I selected government IT project managers with specific skillset, knowledge, and experience of strategies for implementing e-government projects in Nigeria and each of the participants possessed five years of successful deployment of e-government projects with skills to design and develop useful and useable technology solutions and preference for increasing systems adoption. Apol et al. (2020) noted that qualitative research is effective and robust if data is collected from knowledgeable and experienced participants; therefore, I did not select participants without cognate experience on the problem phenomenon but participants who have successfully implemented at least two e-government projects in Nigeria in the last five years with skills to bridge information systems design-reality gap and preference for technology adoption. Joubert et al. (2022) advised that participants

should have hands-on experience and knowledge required to address the interview questions. The details of the interview questions as shown in (Appendix B) reveal the strategies used by the Nigerian government IT project managers (interviewees) to implement e-government projects. To select the appropriate participants for this study, I used pre-interview questions to determine the level and relevance of their expertise (L. O'Sullivan et al., 2021) at implementing e-government projects; I also probed to know their previous and current roles, titles, and departments to ascertain their suitability.

Lamprianou (2022) said a gatekeeper, who is an intermediary between a researcher and potential participants with the authority to deny or grant permission for access to potential research participants, may be required for interview sessions. However, in this research, I did not need gatekeepers because I used qualitative method with pragmatic inquiry design which allows a researcher to have direct access to the research participants without requiring an intermediary. I identified the participants through a stakeholder mapping exercise at each site. I purposively sampled the participants to ensure I got maximum and impactful knowledge and experience.

To give credence to the research and produce authoritative results, Schulz (2021) advised researchers to strategically select multiple sources that are relevant to the subject. Also, Woolf and Edwards (2021) advocated that inaccessible participants could pose a threat to the success of the research; therefore, getting the consent of the participants provided me opportunity to have easy access to them to run my research unhindered. Since I did not need the permission of gatekeepers before I contacted participants to interview in the partner organizations via their e-mail addresses (see Appendix C)

through which I introduced myself, the purpose of the research, its potential positive social implications, and then request for their consent to participate in my study. I then followed up with another e-mail requesting for their suitable date and time so that I could make follow-up calls to explain the study and its purpose in detail and to answer their questions or clarify grey areas, if any (see Appendix C). After getting their affirmative responses, I sent the second email (see Appendix D) to thank them for agreeing to participate in the research and to request a convenient date and time to interview them. To help the participants make adequate preparations, I informed them ahead of time by email that the interview mode and medium would be virtual through Microsoft Teams or Zoom platform. I also attached a copy of my interview questions in the email to enable them to read ahead and prepare adequately beforehand. I requested the participants to confirm which of the virtual medium platforms (Microsoft Teams or Zoom) they preferred, and they did.

Jenkins et al. (2020) opined that building cordial relationships with participants and sharing adequate and necessary information about the research allow them to be free with the researcher, without holding back vital information that could help the researcher in data collection. Gleibs and Albayrak (2022) explained that interviews are potent quantitative research tools to collect detailed information and individual viewpoints on a phenomenon. I sent a virtual meeting invitation to each of the participants a minimum of 2 weeks before the interview dates they advised, and reminder emails two days before the interview dates. Apart from making the interview process conducive and friendly, using Microsoft TEAMS collaboration medium allowed

me to observe the interview process via audio and video media and to observe the interviewees' facial expressions, body language, and gesticulations during the interviews while I recorded the interview sessions. I gave enough time between an interview and a subsequent one; this allowed me to watch and listen to the previous interview, to collate, and arrange the data properly.

In compliance with Walden University IRB ethical requirements for minimal risk, I ensured ethics is at the center of my data collection activities as I applied ethical considerations across all the phases of data collection process (Creswell & Poth, 2018). I ensured that the interviewees were not minors but adults of 40 years old and above; they were mentally and emotionally balanced and I neither held any supervisory responsibility over any of them nor had they rendered any service directly or indirectly for me; therefore, they spoke freely and objectively on the research phenomenon without allegiance to me. The participants did not request, nor did I offer them any compensation, payments, or reward. They decided to participate in this research on their own volition and due to their passion to be positive social change agents.

I obtained the informed consent of each participant in this study, and I introduced the purpose of the study, its benefits including the details of participants' roles in the study. In line with Gelinias et al.'s (2021) argument, ethical standards must be upheld in research to ensure participants' confidentiality and protection. Based on this, I let the participants know their right of confidentiality to ensure their trust and respect; I informed them that their names, offices, and other identity would be encoded to ensure anonymity; that they were free to opt out of the research process

anytime, and doing so shall be without any repercussions. I saved participants' personal identifiable information in a secured file on my laptop and USB to ensure the confidentiality (Greer et al., 2023) of each participant and to ensure easy recovery in case a file is damaged or corrupted. Before I commenced each interview, I obtained permission from each participant to record the interview session and to take notes while the interview was ongoing.

Qualitative research methodology allows researchers to use their interpersonal skills to evaluate a research topic (Waling et al., 2022). My interpersonal skills, openness and transparency coupled with my frequent and polite engagement of the participants helped me to build relationships with them; therefore, the participants will be willing to volunteer necessary and relevant information regarding their experiences at implementing e-government projects in Nigeria.

Research Method and Design

There are three main types of research methods: the qualitative, quantitative, and mixed methods. To select an appropriate research method for a study, Newman (2022) advised that researchers should consider major factors such as the research goals, scope, and the type of data - either numeric or text, data collection and analysis methods required to appropriately answer the research question. Apart from these, other factors I considered in selecting the research method for this study are research ethical requirements - safety and security of the participants, and the appropriate theoretical framework to ground the study.

Also, Yin (2018) pointed out that researchers must ensure that the research design connects and links the study data to the research question to aid plausible results. In this study, I utilized the qualitative research approach and pragmatic inquiry design while qualified participants included experienced government IT project managers who have strategies for implementing e-government systems in Lagos State of Nigeria.

Research Method

Having extensively reviewed the various options of research methods, I selected the qualitative research method for this study to understand how the Nigerian government IT project managers experience the world by collecting and analyzing non-numeric data to understand concepts, opinions, and experiences of the participants on the strategies they use to implement e-government projects. Qualitative research method is used to gather information and gain deeper insight into a phenomenon to propagate new ideas for future research. It is a research method that possesses the techniques for conducting inquiries aimed at discovering how human beings understand, experience, interpret, and contribute to their social world (Fox & NicGiolla, 2021).

Researchers utilize qualitative approach when they seek to create themes from data analysis (Malterud, 2022). In this study, I collected data through semi-structured interview process using open-ended questions; data collected were analyzed to create themes. I utilized qualitative research methods to collect, analyze and interpret data based on themes, patterns and traits based on the perspectives of the study participants. In a qualitative study, the data collection methods include observation, interviews, and assessing partner organizations or public domain documents (Whiffin et al., 2022). I

selected the qualitative research method to analytically evaluate previous and current data and references regarding the topic.

Matta (2022) noted that when qualitative approach is used for a study, there should be a venue for the study participants to convey their points of view. Therefore, since this study focuses on taking participants' experiences and perspectives of the problem phenomenon, I ensured that the venues and / or online medium used to conduct the research interviews were conducive for both the researcher and participants to share their opinions, experiences, and perspectives of the phenomenon. Also, Jowsey et al. (2021) pointed out that qualitative researchers take notes and records scenes in the various phases of the research process; in this study I took journal notes of the information and data collected from experienced professionals that are subject matter experts in e-government implementation projects.

The researcher's ability to segregate complex social phenomena into related patterns or themes is an important attribute that engenders the use of qualitative approach. Also, Yin (2018) asserted that since social phenomena are complex and interwoven, they are impossible to split, decipher or cascade to variables; therefore, qualitative research method is best suitable to unravel social phenomena. In view of this, and since the focus of this study was to explore the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems, qualitative approach is the most appropriate research method to provide viable answers to the questions of this study.

I did not select quantitative approach for this study because quantitative research method is ideal for collecting and analyzing numerical data, identifying trends and averages, making predictions, testing relationships, and generalizing results for large populations (Harris, 2021). Syed and McLean (2022) said researchers utilize the quantitative method to solve problems and formulate hypothesis by studying variables and their relationships (Benzing et al., 2020). For this study, my focus was to collect data through semi-structured interviews with open-ended questions regarding the perspectives and understanding of the participants; therefore, I utilized the qualitative method.

Qualitative method is a technique for demonstrating relationships between variables; therefore, the approach utilizes numerical instruments such as mathematical and statistical tools for data collection and analysis, surveys, and structured questionnaires (Ahmed & Ali, 2023). Obtaining mathematical and statistical data and use of surveys were impracticable for this study; hence quantitative methodology is inappropriate (Bates et al., 2023). Zwiener-Collins et al. (2023) affirmed that the quantitative method fosters the use of variables to test the authenticity of a hypotheses through statistical analysis. Also, Meyer and Schutz (2020) corroborated that quantitative methodology is used by researchers to test the viability of a theory. In this study, I did not intend to test theories but to explore the strategies used by government IT project managers for designing and developing useful and usable e-government systems in Nigeria; therefore, qualitative research method is inappropriate for this study.

The mixed methods use a combination of both quantitative and qualitative research approaches, this is not an adequate or a consistent research method for this study which does not require the analysis or comparison of variables. The Mixed methods will not provide adequate answers required to address the research questions for this study. According to Hitchcock et al. (2023), mixed methods is a suitable approach for conducting research study comprising of both qualitative and quantitative data collection and analysis from a single study. The purpose of this study is to explore the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems; hence the qualitative method is sufficient to answer the research questions. Em et al. (2023) argued that utilizing the mixed methods approach by consolidating the qualitative and quantitative methods is a more complicated process than just selecting one method. The mixed-methods approach is inadequate for this study since it includes quantitative statistical concepts which are irrelevant to this study. A mixed methodology provides a hybrid approach to a research study by combining qualitative and quantitative research concepts and techniques, resulting in more granular results for a better understanding of the data. This study requires a deep understanding of the problem statement consistent to the implementation of e-government systems which required exploring the strategies used by IT project managers to design and develop e-government systems. Therefore, the mixed-methods approach is not consistent for this study phenomena.

Research Design

Depending on the research question and the appropriate data collection approach, the qualitative research method applies to various design approaches, including ethnography, narrative, phenomenological, grounded theory, case study, and pragmatic inquiry. For this study, I used pragmatic inquiry design to connect data collection methods to the research questions and to explore answers that will provide authoritative results. Researchers use the pragmatic inquiry design in a qualitative study when gatekeepers are not required. I chose pragmatic inquiry because I had direct access to my participants/interviewees. Also, the pragmatic inquiry is more practical than single or multiple case studies since it does not require any intermediaries for prior official permission to interview the participants in the partner organizations. As McMullin (2023) pointed out, pragmatic inquiry design provides the researcher with an in-depth understanding of a phenomenon, I utilized pragmatic inquiry design for this study because it provides insights into the information and tools required to explore the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems.

Also, the pragmatic inquiry design can use data from different sources while exploring solutions to a problem phenomenon within a defined context (Gatehouse & Pickles, 2021). In this study, I collected data from multiple sources through semi-structured interviews with open-ended questions, information from literature reviews, and approved government documents or research documents marked “public” retrieved from public domains. Wutich et al. (2021) added that researchers use pragmatic inquiry design

to interpret contextual data collected from real-world situations to make informed decisions with guidelines to answer the research questions. Therefore, the pragmatic inquiry design is appropriate for this study to explore strategies government IT project managers use to design and develop e-government systems in Nigeria; this will provide appropriate insights to the government IT project managers while contributing to the body of knowledge.

The pragmatic inquiry design is a potent tool for exploratory answers to a phenomenon through interview, observation, and document reviews because it fosters clarity of the interview data to answer the research question. Corroborating this point, Cena and Burns (2023) affirmed that drafting appropriate and concise research questions engenders accurate data collection and interpretation that addresses the research phenomena by using a pragmatic inquiry design.

Yin (2018) further emphasizes that conducting multiple pragmatic inquiries reinforces and ascertains credibility and reliability due to multiple sources of data with expanded sample space. To provide a holistic exploration approach, I utilized the pragmatic inquiry design to evaluate data collected from participants in line with qualitative approach from which I drew holistic explorative conclusions (Latham, 2020). I utilized pragmatic inquiries for this study because of its innate features of inquiry techniques and tools to collect and analyze data from various sources in line with the qualitative approach to understand the nuances of the problem. I collected data from participants who shared the strategies used to design and develop e-government systems in Nigeria.

Researchers use phenomenological design to understand a phenomenon's nature by exploring the perception and views of those who have experienced it. This approach is popularly used to study lived experiences to understand how human beings think and interact with phenomena. Phenomenological research is a qualitative research design that seeks to investigate the everyday or lived experiences of people to gain deeper insights into how people understand those phenomena while suspending the researchers' preconceived knowledge and assumptions about the phenomena (Langdrige et al., 2021). Since this study does not focus on exploring peoples' lived experiences but on exploring a phenomenon within a defined context, the phenomenological design is not appropriate.

According to Tutar (2023), phenomenological research design assumes that people adopt a general belief system to make conclusions about their lived experiences. Also, phenomenological research design interprets the participants' perspectives, feelings, and beliefs to understand and draw conclusions on the phenomenon under investigation (Ranjan et al., 2023). Since the focus of this research was not to describe or explore the lived experiences or perspectives of participants living through a phenomenon, but to explore the strategies used by government IT project managers for designing and developing useful and usable e-government systems, the phenomenological approach is inappropriate for this study.

Ethnographic research design is a qualitative approach used for learning and understanding the behavior, interactions, practices, and culture of a group of people within a particular context. Researchers in ethnographic research immerse themselves

in a particular community or organization to observe their behavior, and interactions to gain a deep understanding of their shared culture, conventions, and social dynamics (Drew et al., 2022). The focus of this study is not to learn or understand people's social dynamics and cultures but to explore the strategies used by the Nigerian government IT project managers to design and develop useful e-government systems; therefore, I did not choose the ethnographic design for the study.

Lippert and Mewes (2021) maintained that ethnographic design is a flexible approach that gives researchers direct insights into the culture and practices of a group to access authentic information and observe dynamics that may not have been found out by simply asking questions. Although ethnographic design offers a rich narrative account of a specific culture (Carvalhaes et al., 2022), I did not choose the ethnographic design for this study since its concepts are not consistent and are inappropriate for exploring data and answering the research questions of this study.

Narrative research is aimed at exploring and conceptualizing the meanings people assign to their experiences by working with participants to obtain rich and free-ranging discourse (Nash, 2022). Narrative research focuses on storied experience (Roikjær et al., 2022), it describes the process of collecting, analyzing, and interpreting storied or narrative data about people's experiences. Researchers use narrative research design when the research question is about telling the life events and stories of a research subject (Pullano & Foti, 2022). Fletcher and Benveniste (2022) explained further that narrative research entails exploring past experiences by organizing and compiling specific events including their timeframes in sequence. Since the results from

narrative research can justify research inquiries, its proper and coherent analysis may ultimately contribute to theories in the social sciences (Orrmalm, 2020). Therefore, proper insight into the ways people interact with and perceive the world around them can engender the deployment of qualitative methods to transform intuitions into theories. Although qualitative research aims at conducting inquiries to develop a general understanding of social structures and social phenomena (Bhangu et al., 2023), narrative research involves a qualitative analysis of people's worldviews to gain in-depth knowledge of a phenomenon based on their understanding and interpretation. Since this study does not focus on telling stories or exploring and conceptualizing the meanings people assign to their experiences, narrative design is inappropriate for this study.

Grounded theory is a qualitative research method that enables the researcher to discover new theories based on systematic real world data collection and analysis while studying a particular phenomenon or process (Luca et al., 2022). Grounded theory is a research methodology used to uncover social affiliations or relationships and behaviors of groups (Zaidi, 2022). Since grounded theory focuses on formulating theories from social settings, it lacks the building blocks required to provide answers to this research question; hence, I did not use it.

The above research designs, phenomenological, ethnographic, narrative, and grounded theory neither possess plausible exploratory capability nor provide authoritative results that comes with pragmatic inquiry design. Therefore, pragmatic inquiry design is the most appropriate for this study. In addition, pragmatic inquiry allows data

triangulation using various data sources (Butcher, 2022) to corroborate the research findings thereby increasing validity and reliability, strengthening conclusions, and reducing the risk of misinterpretations.

The quality of a research study depends on the trustworthiness of its results. Erdmann and Potthoff (2023) affirmed that an imperative tenet of qualitative research that must be fulfilled is ensuring data saturation. This fact was reiterated by Clare (2022) that non-attainment of data saturation in a qualitative research study might compromise its results and hamper validity. Researchers ensure data saturation in qualitative research to confirm the quality of data when no more new information regarding the study phenomenon is discovered during data gathering (Audulv et al., 2022). Using the qualitative pragmatic inquiry research design, I ensured data saturation through proper collation of sufficient data to draw necessary conclusions (Van-der-Weele & Bredewold, 2021). I collected data from interviewees until no new data, theme or information were received from participants.

To ensure credibility, I used member checking technique with which I organized follow-up meetings to provide the data collected back to each participant or interviewee to validate or review their responses for accuracy and resonance with their experiences and to avoid misrepresentation of facts thereby ensuring the credibility of results. Using member checking will further help attain data saturation since participants will have the opportunity to validate their responses (Roulston & Halpin, 2021).

Also, I use data triangulation to achieve data saturation via the use of multiple sources or methods to collect data on the same research topic (Truman, 2023). With the

use of the above techniques, selection of correct sample size, member checking, and data triangulation, data saturation of this study was guaranteed.

Population and Sampling

The targeted population for this qualitative pragmatic inquiry study comprised experienced Nigerian government IT project managers currently employed with medium and large-sized organizations including government institutions located in Lagos State of Nigeria. The sample size used in this study is 12 participants possessing experience of strategies for designing and developing useful and usable e-government projects in Nigeria with skills to bridge application design-reality gap and ensure seamless technology adoption.

Newington et al. (2022) stated that the experience and knowledge of participants about the phenomenon being studied, to a large extent, determines the sample size required for the study. Qualitative researchers select participants based on their knowledge of the research topic, ease of accessibility, availability, and willingness to participate (Peach et al., 2023). An ideal sample size is selected depending on factors such as the research question, population, and objectives. Also, while too large a sample size may result in gathering repetitive data with no information, it is incumbent on the researcher to determine an adequate sample size to ensure the attainment of saturation is not undermined Bujang (2021). Therefore, I selected a sample size of 12 participants because it is considered adequate for this study to generate enough data from various participants required to thoroughly answer the research questions and to attain data saturation thereby establishing validity. Larson (2020) affirmed that research sample size

should be large enough to sufficiently provide information regarding the phenomenon being addressed in the study. Sample size should be homogeneous to focus the study on exploring ideas and themes from the selected population (Kekeya, 2021). I selected homogeneous sample size by ensuring that all the participants possessed the skills listed below in the homogeneous selection criteria; participants were rigorously screened during the recruitment process to ensure the integrity of the study. The following criteria were used to select eligible participants who possessed the skills to unravel this study phenomenon and provide appropriate data that can answer the overarching research question. The participants must be seasoned IT project managers who have demonstrated impeccable track records in the following areas (a) knowledgeable and dexterous in designing and developing useful and usable e-government systems, (b) possession of a minimum of six years cognate experience in e-government project design, development, with skills to reduce design-reality gap; (c) participants must be solutions providers with skills on strategies for developing e-government systems and must have successfully implemented at least two useful and useable e-government systems in the last 4 years; (d) ability to coordinate and ensure change management and seamless technology adoption is key. With the crisply defined selection criteria and rigorous screening process, the sample size is adequate to address this study phenomena. Curtis and Keeler (2023) emphasized that effective sampling is imperative in qualitative research since inadequate sampling may dilute the research credibility leading to questionable results.

I used the purposive sampling technique to select qualified participants for this study. I adopted purposive sampling to determine the participants' skills and cognate

experience in the research topic and to select qualified subject matter experts who can answer the research questions. Purposive sampling is used in qualitative research methods to select subject matter experts in a particular field as participants (Andrade, 2021). I chose to use purposive sampling for this qualitative pragmatic inquiry study because it is most applicable and aligns with the method and design of this study. In addition, the sample size of this study is relatively small; therefore, purposive sampling is the appropriate sampling technique consistent with it. Junus et al. (2023) recommended purposive sampling as suitable for qualitative research that investigates a small sample with a need to collect data from all members of the population. Furthermore, purposive sampling is consistent and appropriate for this study because being a subset of non-probability sampling, it fosters an information-rich study, and each participant did not have an equal chance of being selected since participants were meant to satisfy predefined criteria.

I ensured data saturation after the collection of sufficient data to draw necessary conclusions when collecting additional data adds no value. Overall, the goal of qualitative research is to achieve saturation fostering data convergence as the researcher notices similar themes and patterns repeatedly with new data inflow Newington et al. (2022). I used member checking to ensure the trustworthiness, credibility, and validity of the results of this study. After the interviews, I returned the transcripts to the respondents and scheduled follow-up calls and meetings with each of them to check and validate that the meaning or interpretations given to their data were accurate.

Researchers use member checking as a technique for exploring the credibility of research results (Erdmann & Potthoff, 2023). During the member-checking process, participants' comments and observations were noted and edited to validate and resonate with participants' perspectives. Member checking created rapport providing the researcher the opportunity to engage with participants after the semi-structured interview. In social research, despite deliberate efforts to turn out reliable and authoritative results by operationalizing various credibility and validity techniques, traces of bias can be introduced deliberately or inadvertently by either or both the researcher or participants (Grace et al., 2023). I mitigated the possibility of bias by - (a) selecting competent research subjects, (b) ensuring adequate sample size to guarantee data saturation, (c) not offering inducement to participants as this might distort results, (d) fostering professional relationships, (f) adhering to Walden University research guidelines, (g) strictly following the interview protocol (Jones & Donmoyer, 2021), and (h) ensuring my sense of judgment was not influenced or beclouded by my knowledge or preconceived notion of the research phenomenon.

Since conducting one-on-one interviews allows firsthand data collection directly from the respondents (Erdmann & Potthoff, 2023), I organized semi-structured interviews for each participant to garner firsthand accurate and informative data about their experience, views, and understanding of the research phenomena from the respondents. Using the specially crafted 11 open-ended interview questions and adequate sample size, I used the semi-structured interviews and open-ended questions to garner data from multiple sources in the sample size to attain data saturation. The interview process which

I conducted based on standard interview protocol was a schematic presentation of questions to explore strategies used by IT project managers to design and develop useful and usable e-government systems. Using the interview protocol guided my exploring the interviewers more systematically and comprehensively and keep the interview focused on the research phenomena (Parker et al., 2023). I prepared core questions to elicit expository facts about the phenomena and recorded the interviews and took field notes during the interview to help focus on the textual prompts thus enabling more details to the interview transcripts.

Ethical Research

To ensure ethics in this study, I adhered strictly to research ethical guidelines and integrity by ensuring that participants' voluntary consent was obtained, including adequate protection of privacy, rights, and wellbeing of participants. After obtaining the IRB approval, I circulated the Informed Consent Forms to each participant; the consent form contains adequate information regarding the focus and purpose of the research study, including details of the rights, privacy, and protection of the participants with risks involved and mitigations in place. I followed up with the participants to obtain their signed consent forms and letters of cooperation and consent to participate in the research. In line with IRB requirements, I ensured participants fully understood the contents of the informed consent form and their voluntary consent to participate in the study was obtained. I gave participants ample time to read and digest the information in the Informed Consent Form, explain any grey areas in detail, entertain questions to ensure participants' understanding and no information was withheld from them. According to

Boothby (2024), an important way to maintain research ethics is to ensure that participants understand the terms and conditions of the informed consent. Belmont report recommends that researchers must adhere to ethical requirements in securing participants' voluntary consent before their involvement in the research process; and in protecting the research subjects from harm, including their privacy and identity (U.S. Department of Health and Human Services, 1979). Since all my participants in this study understand English Language, I did not need to engage an interpreter for them to understand the contents of the informed consent, neither did I need to seek the consent of a child's parents or guardian since my research subjects were not children but adults. According to the U.S. Department of Health and Human Services (1979), in case the participants are underaged, the consent of their parents or guardians must be sought and obtained, and where a participant does not understand the language of the Informed Consent Form, an independent interpreter must be engaged to ensure that participants understand what the research is all about.

Prior to circulating the Informed Consent Form, I sent emails (see Appendix A) to request the participants' consent to participate in the research. I let the research subjects know that participation was voluntary; and they had the right to withdraw from the research process at will and at any time without prejudice, risk, or penalty (Sou & Hall, 2023). In case of participant withdrawal, I ensured that the data collected from the participant was permanently destroyed and the participant's confidentiality maintained. I ensured that no participant was forced, coerced, or lured to participate in this study; and I did not take undue advantage of or influence the participants by offering of inducement

or undue incentive, reward, or make unwarranted overtures for them to participate. According to Vega et al. (2020), observing research ethics requires that the research subjects be provided with opportunity to voluntarily decide their participation or refusal to participate in the research process and their decision should be honored without any repercussions (Murray & Irlbeck, 2020). In this study, I ensured that the research subjects offer themselves of their own volition and because of their personal interests and conviction to add value to the world by finding solutions to the research problem. As Tubig and McCusker (2021) affirmed, coercion occurs when deliberate threat or harm is made to a potential participant to enforce compliance or their participation, while undue influence could be through the offer of inappropriate reward or inducement.

To protect the rights and confidentiality of the research subjects and information volunteered, I let the participants know their rights of confidentiality since this will boost their trust and confidence in the research process. I guaranteed their confidentiality by ensuring that their names, office names, addresses, occupation, cultural and religious backgrounds, and other identity, including their personal identifiable information were encoded by using pseudonyms. I used pseudonyms to protect the participants identities, ensure anonymity, and avoid the risk of data breach, compromise, or theft (Makhoul et al., 2023). In line with Potthoff et al.'s (2023) argument, research subjects must be protected from harm and the researcher should safeguard their confidentiality.

All the data collected for this study, such as emails, recorded audio, video data and documents, will be saved electronically in an encrypted format; each file will be protected by a strong password while journal reference, field notes and all printed

documents obtained from public domains will be stored in a lock and key vault. In compliance with Walden University guidelines, all the electronic data and printed documents will be stored and retained for at least five years to protect the participants' confidentiality after which it could be destroyed. The National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research (1979) provided guidelines on the protection of data collected during interviews, including destruction of data as soon as it is no longer needed. This assertion is further agreed to by Hammett et al., (2022) that data and documents used for a research study become irrelevant and may be destroyed after five years. I prevented research data loss, data breach, or compromise by taking backups of all electronic data and archive them on a secondary storage medium, such as external hard disk, USB, and Microsoft OneDrive cloud storage platform. The external data storage devices and other research documents were stored in a secure offsite fireproof safe with key combination locks, located in a private vault. I am the only person who knows the access combination key of the fireproof safe and has access to the data.

I ensured that all parts of this study complied with the approved ethical standard and requirements of Walden University IRB; I also presented my research study for IRB's evaluation and approval for satisfying ethical and professional requirements before reaching out to participants. I placed or indicated the IRB approval reference number on the appropriate page of my dissertation and attached it to my doctoral manuscript. Walden University research ethical guidelines requires that research students obtain the approval of IRB, which ensures that students satisfy ethical requirements such as strict

adherence to the applicable laws, institutional standards and regulations for professional conduct and practice (King, 2023). IRB ensures that the researcher (a) obtains written informed consent of each participant, (b) ensures the privacy of the participants, (c) protects the participants from bodily and emotional harm, and (d) ensure that there is no conflict of interest (Dove & Chatfield, 2023) before contacting participants or partner organizations.

Data Collection Instruments

Being the researcher, I was the primary data collection instrument in this qualitative pragmatic inquiry study. I chose to be the primary data collection instrument to ensure data collection method aligns with my research objectives and questions, to avoid errors, and improve data quality. Due to their strategic roles in facilitating data collection from research subjects, researchers are better primary data collection instruments while other data collection tools could be added (Eckstein et al., 2020).

Another data collection instrument used for this study was semi-structured interview with a list of 11 well-crafted open-ended interview questions (see Appendix B). The questions are effective data collection tools during one-on-one or face-to-face interviews to understand the perspectives of the participants on the phenomena; the open-ended interview questions which were easy to understand allowed the interviewees to respond in their own words the detail understanding of the phenomena. Parker et al. (2023) cautioned that poorly constructed qualitative research questions can result in ambiguous responses thereby affecting the study results, diluting its trustworthiness and

credibility. I used the interview protocol as an essential data collection instrument to collect detailed credible information from the participants.

Another instrument used to collect data in this study is the reflective journal. I used the reflective journal to make notes of information vital to the study and that helped give appropriate meaning and understanding to the data collected. I used reflective journal to capture the study presupposition and rationale for every action to help better reflect on the information captured. Yee et al. (2022) advised that the use of a reflective journal in research assures the capturing of salient and relevant action points, ideas, perspectives, and experiences in the research process. While using the reflective journal, I ensured that my personal opinions, beliefs, or preconceived ideals did not becloud my reasoning, but I captured the raw data as volunteered by the participants. Erdmann and Potthoff (2023) advocate that using a reflective journal helps in data analysis process to facilitate reflexivity, to examine assumptions and goals, and clarify individuals' beliefs and subjectivities.

I used field notes to record my interpretation of different sections and my encounters in the field, this helped me explain my observations and reflected on why they are relevant and important. I used field notes to capture events, conversations, and nonverbal actions and behaviors of the participants observed during the interviews and other data-capturing sessions. Researchers use field notes as a compendium of contextual documentation of vital research information in the field on which the researcher can reflect (King, 2023). While capturing data during the planned semi-structured interview sessions, I took field notes to record my observations and keywords that can be used as

prompts to obtain detailed information to validate the initial information captured from the participants (Dove & Chatfield, 2023).

Also, I used approved documents collected from public records to collect supplementary data to strengthen and support my study. I collected and reviewed data from secondary sources such as relevant public journals, government publications, websites, and approved public information technology policies and procedures with relevant information on strategies for implementing e-government projects in Nigeria. Researchers use document review to collect and analyze existing qualitative research data from secondary sources (Parker et al., 2023).

I followed interview protocol model with my prepared set of open-end interview questions (see Appendix B) to prompt fact-finding discussions with the interviewees and to capture insightful data critical to the success of this study while exploring consistent themes. The open-ended nature of the question provides opportunities for me as primary data collection instrument to prompt respondents to share more detailed insightful information. The semi-structured interview in a qualitative research method provides detailed and rich information from the respondents while exploring themes on the subject (Newington et al., 2022). I used follow-up questions during the interviews to seek clarification and gain relevant information with deeper insights into the points made by participants. Semi-structured interviews with open-ended questions are flexible interviews that allow the researcher to probe the interviewees for a deep dive into elaborate information (Yuying & Hennebry, 2023) while expressing their views of their own accord.

To ensure reliability and validity, I captured data from multiple sources such as interview transcripts, observation, reflective journals, and field notes supported by relevant secondary data from government publications, websites, policies, and procedures that are relevant to strategies for implementing e-government systems in Nigeria. Data capturing from diverse sources provides authenticity, and objectivity while removing bias to engender authoritative results (Eckstein et al., 2020). Information captured from multiple sources and properly analyzed prevented biases and errors to increase the trustworthiness of the results. Also, I reviewed relevant documents or manuals in Lagos State government offices and consulted e-government systems implementation guides in credible government IT project managers' offices that have strategies for implementing e-government projects that will provide rigor and validity to my study. Yin (2018) suggested that obtaining secondary data from electronic or other documents in qualitative studies is beneficial for validity. I combined data from the above sources with proper analysis to get convergence into themes thereby guaranteeing corroborative, cohesive, and reliable results. Based on Jones and Donmoyer (2021) submission, multiple data sources used in qualitative research increases the trustworthiness of its findings.

In this qualitative pragmatic inquiry study, I used the methodological triangulation approach to ensure data convergence and to reach credibility and validity. Research techniques such as triangulation to increase reliability and validity (Vivek et al., 2023).

Also, to increase the credibility of the results, I used member checking to organize follow-up meetings with each interviewee to confirm the accuracy of the data collected

and validate if it resonated with the information earlier provided. Member checking was carried out by transcript review before completing data analysis of the interview not after coding. Member checking allows interview respondents to confirm the accuracy of the interpretation of their information volunteered to increase validity (Kataoka et al., 2023). Confirmation of no-gap and that the intended meaning is accurately captured in the data elucidate credibility and validity (Jones & Donmoyer, 2021) which also confirms the authenticity, credibility, and validity of the data collection instruments used in this research.

Data Collection Technique

In this qualitative pragmatic inquiry study, the primary data collection technique I used was the semi-structured interview method. I also utilized one-on-one semi-structured interviews with open-ended questions to collect information directly from respondents, to understand their experiences, knowledge, and perspectives on strategies they use for designing and developing useful and usable e-government systems. Shenkoya (2023) confirmed that one or more data collection techniques such as interview, survey, focus group, observation, textual or visual review of documents could be used in qualitative research. In addition, other data collection techniques utilized in this study were the review and analysis of relevant and approved government documents such as IT policies, e-government implementation guidelines, information on the organizations' websites, and related documents regarding strategies for implementing e-government projects from public or government offices. Cleaton et al. (2021) further encouraged researchers to review partner organizations' and authoritative government

documents consistent with the research phenomena since data from multiple sources could deepen understanding, answer the research questions, and ensure data triangulation. Other data collection techniques that would be used in this study are my field notes and reflective journals. Major activities that were carried out during this phase of the study are data collection, data preparation, sorting, analyzing, data interpretation.

In compliance with the Walden University ethical guidelines, I ensured that IRB approval was obtained before proceeding to contact potential participants. Thereafter, I sent invitation letters or emails to the participants and obtained their letters of consent to participate in the study including the executed informed consent form.

I began the interview process by contacting each participant to request their convenient time and dates to schedule their interview sessions, I gave the interviewees the options for physical face-to-face sessions at their preferred locations or virtual interview meetings via Microsoft (MS) Team or Zoom platform. I transmitted the transcribed interview questions to the interviewees ahead of the interview dates so that they could understand them and be adequately prepared to share in-depth views about the research phenomena. For those who preferred the virtual meeting option, I sent scheduled MS Teams meeting invitations to each of the participants indicating the agreed time and dates with each participant. I sent a reminder email to each participant a day before the interview sessions to prepare them and ensure their calendar was still free for the sessions. I ensured that the interview protocols were strictly adhered to; to avoid possible distractions during the interview sessions, smartphones were turned to silent or do-not-disturb or airplane mode.

At the commencement of each interview session, I introduced myself, the research, and its purpose, and requested the permission of the interviewees to record the interview sessions and to take notes during the sessions. For participants who indicate in-person face-to-face meetings, the interview venues were conducive, free from noise and other distractions while using my iPhone 14 Pro Max smartphone to record in-person face-to-face interview sessions. I use the Record-Meeting feature on the Microsoft Teams platform to record the interview in virtual mode. I reiterated the participants' right to opt out of the process at any time they wished without prejudice or repercussions.

Following the interview protocol, the research questions were open-ended to elicit detailed and rich information from participants. I did not interject while the interviewees were talking unless at their request, I did not craft or ask the interview questions in a manner to influence their thought process and answers to align with my preconceived ideas since this act is contrary to research ethics already pledged and may distort my study results. The open-ended nature of the research questions allowed me to ask for clarifications by asking follow-up questions that prompted respondents to share more information thereby eliciting compelling facts about the phenomena. In line with the interview protocol, I asked each participant the same set of questions, and each respondent was given an equal opportunity (Maldonado-Castellanos & Mondragón, 2023) to respond to his satisfaction. Arnold et al. (2023) pointed out that a well-defined and structured interview protocol engenders the acquisition of high-quality data from research subjects.

In this study, I used member-checking to assure the integrity and accuracy of all data collected. After the interview sessions, I collated and transcribed the information collected during the interviews in a legible manner and conducted member-checking to ensure the information in the transcript and meanings ascribed to them conform with and reflect the exact research subjects' perspectives (Grace et al., 2023). I used information quality assurance coupled with confirmation of the accuracy of interview transcripts for establishing the validity and accuracy of the data. Member checking increases the value and quality of research data fostering the trustworthiness and reliability of research results (Kataoka et al., 2023). I used the within-method data triangulation technique to collect qualitative data from multiple sources to ensure data saturation. Data saturation is attained when new data collected has no additional value contributed to the existing results. Researchers use data saturation to ascertain reliability and validity (Adekola et al., 2023).

The recordings made on the Microsoft Teams platform and my iPhone were copied into an external hard disk drive, OneDrive cloud medium and USB storage and were protected with strong non-easily guessable passwords. All email correspondence with the participants were also stored in the specified storage media. One storage medium serves as a backup for the other. The recorded files on the MS Teams platform and my iPhone were deleted to prevent data breaches that might compromise personal identifiable information and to assure data privacy and integrity. The storage media were kept in a lock and key vault for further protection from loss, theft, destruction, or data compromise.

Data Organization Techniques

In qualitative research, data is an asset; therefore, I organized data collected from various sources in such a way to make meaningful conclusions, present information in a simple, easy-to-interpret format. I collected enough data to answer the research question and I organized the data in the most logical and orderly way possible, to make its interpretation, presentation and understanding easy. According to Patel et al. (2022), researchers organize data into groups and categories for easy and faster access, processing, and analysis.

I maintained reflective journals throughout the research study to take detailed notes of what I did, my thoughts and perceptual experiences in the process of data gathering and analysis. While collecting data on the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems, I used reflective journal to organize data on my discoveries, observations, experiences, actions, and rationales behind the actions during the process. Wyatt et al. (2021) noted that the use of reflective journals enables researchers to broaden their perspectives which enhances reflexivity to clarify conceptual details and actions.

In this study, I used pseudonyms as data organization tool; I created and assigned pseudonyms to code information and protect all the participants by hiding their identity on their data, transcripts, notes, emails, office addresses, and videos to ensure anonymity. Sale (2022) submitted that the privacy of research subjects can be protected using anonymity while collecting, analyzing, and reporting data shared by the participants. Each participant's identity was coded with unique pseudonyms such as P1 for

Participant1, P2 for Participant2, P3 for Participant3, up to the last person, P12 for Participant8. Likewise, their addresses, organization names and other means by which the participants' identities could be traced were coded. I kept track of the data volunteered by each participant to ensure they are correctly and uniquely coded and mapped to the exact participant's pseudonym to avoid a mix-up, guarantee anonymity and confidentiality. Schmidt et al., (2021) cautioned that maintaining data accuracy and integrity is imperative during data collection; I arranged coded data into categories and related themes to assist in grouping similar data.

Participants who opted for virtual interview sessions, the data collected from the semi-structured interviews will be recorded on the Microsoft TEAMS or Zoom (depending on the participants' preferred virtual platform), while data collected during face-to-face, or in-person interview sessions was recorded on my iPhone14 smartphone. At the end of each interview session, I transcribed the interview data collected and saved it on my laptop local drive with backup copies on the OneDrive cloud, external hard disk, and a USB storage media. The data files and storage media were protected with strong passwords known by only me. The external disk, USB and physical print documents were securely kept in a vault.

Also, from the reflective notes taken and related documents received from public domain, I created digital records by scanning the documents and saving them on my laptop, One Drive and external storage media, Hard Disk and USB drives. To avoid unauthorized access or change to the data that may result in data loss or data breach, I saved the files in PDF format with a strong password on each storage medium. I will

retain the research data for 5 years after which I will permanently destroy the data from all storage media while all hard copies would be shredded in line with Walden University research guidelines. Yee et al. (2022) pointed out that data and documents used for a research study become irrelevant after 5 years, and that it may be destroyed.

Data Analysis Technique

Apart from data gathering, sorting, organizing and correct interpretation to reveal its meaning, how the data proffers enduring solutions to the research problem is paramount. During data analysis, I reviewed all the data collected to ensure they are relevant and tenable to answer the research question and to produce authoritative and reliable results. I reviewed and synthesized the data collected until themes emerged with data convergence to provide accurate interpretation of the information and perspectives of the participants (Naeem et al., 2024). I encoded, structured, and interpreted the data collected from interviewees and public domains to understand its meaning.

Since qualitative pragmatic inquiry research fosters data gathering from multiple sources, I used the within-methodological triangulation to perform data analysis to birth reliable and valid results. The within methodological triangulation was ideal for this qualitative pragmatic inquiry study because the flaws in one data source, if any, were easily compensated by the strength or facts in other data sources (Naeem et al., 2024) thereby enhancing the validity of the findings. With the use of multiple data sources in this study, I prevented potential biases and other flaws while the within-methodological triangulation increased credibility and validity of the study. It also focused on the study to accurately evaluate and reflect the phenomena being investigated (Oluwafemi et al.,

2021). The within-methodological triangulation provided a broad and deeper insight into the research phenomena by the convergence of information to ensure validity.

Thematic analysis is a qualitative data analysis technique that identifies similar patterns in the meaning of the data and evolves themes. Using thematic analysis technique coupled with Yin's (2018) five-steps data analysis approach (i. Compiling, ii. Disassembling, iii. Reassembling, iv. Interpreting, and v. Concluding), I reviewed, encoded, ensured data convergence, and interpreted the qualitative data. I identified and grouped similar and related patterns of information and formed themes into different categories. Researchers use thematic analysis to categorize and deduce the meaning of qualitative data elements (Abfalter et al., 2021). I then used thematic analysis to encode the themes into categories, and each category of data set was interpreted to reveal their key insights.

Manual data analysis is prone to errors, especially when analysis involves large data; to achieve a thorough and flawless analysis, I uploaded the research data into NVivo, a qualitative data analysis software, to consolidate and evaluate all my data. NVivo data analysis software is a versatile application used by researchers to import, organize, and explore, data to produce significant insights and inferences (Emara, 2023). I used NVivo software to evaluate the data and establish how the nuances and concepts of my conceptual framework, TAM, complemented the strategies for developing e-government systems. The use of thematic analysis technique established a relationship between the key themes and TAM model. After the digital data analysis, I used NVivo to accurately generate graphical representation of the data, the pictorial representation

helps data segregation using codes to organize them into themes to answer my research question.

Reliability and Validity

Reliability and validity are concepts used to measure, evaluate, and ascertain the quality of research. To achieve reliability and validity of this research results, I planned and incorporated the rules of reliability and validity into the research process right from the definition of the research question, selection of the appropriate research methodology and design. Also, I ensured reliability and validity rules were incorporated by having the right data collection method, data analysis process, appropriate sample size able to answer the research question and correct interpretation of the data. Achieving reliability in a study ensures that its results can be reproduced, or the same results are consistently achieved when the research is reconducted under the same conditions (C. Mustafa, 2021).

I ascertained reliability by ensuring that data are collected from valid and reliable sources, I ensured consistency of the information gathered from various sources and the consistency of my research method throughout the research process coupled with proper documentation. Reliability can be projected or estimated when different versions of the same measurement are closely aligned (Hendrickson et al., 1993). Jones and Donmoyer (2021) confirmed that proper documentation of research processes ensures repeatability.

I assessed validity by determining the extent to which this study findings supported established theories and other measures of strategies for designing and developing useful and useable e-government systems in Nigeria. I ensured validity by

using methodical triangulation to ensure data collected reaches saturation to increase trustworthiness of the results.

Also, used member checking to avoid data inconsistencies, for participants to validate their responses while data collection from multiple sources was used to ensure validity of my study findings. Validity can be attained in a study if its results provide the desired solutions to the phenomena being investigated (C. Mustafa, 2021). For a study result to be considered authoritative, its validity and reliability is imperative. In qualitative research, validity refers to the level of appropriateness of the research findings in relation to the research question (C. Mustafa, 2021).

Dependability

Dependability is a concept that confirms the research results as consistent and repeatable by other researchers thereby establishing trustworthiness. Research results are considered dependable if found consistent with the data collected and if other researchers can utilize the data under the same conditions, to arrive at similar results, interpretations, and conclusions. Dependability measures the extent to which a research study could be repeated by other researchers and reveal similar findings (McCall, 2023).

I ensured the dependability of this study by engaging rigorous data collection and analysis techniques coupled with comprehensive documentation of the actions and processes carried out in the study. River et al. (2023) affirmed that maintaining rigor in the conduct of various phases of research fosters its replicability resulting in high dependability high. Also, ensured that the research process is thorough by facilitating in-depth discussions in the interview sessions guided by properly crafted and well-structured

open-ended research questions to prompt unbiased answers with proper data collection tools.

Credibility

The quality of research and its value is determined by its credibility or flawlessness of its findings; thus, without credibility, the research results may be considered untrustworthy. Member checking ensures the credibility and trustworthiness of research results when participants are given the opportunity to confirm the accuracy of the interpretation given to their data. I used member checking to establish credibility by returning the interview transcripts to the respondents and scheduled follow-up calls or meetings with each of them to check and validate that the meaning or interpretations given to their data were accurate and it resonates with their perspectives. River et al. (2023) affirmed that member checking is a technique for exploring the credibility of research results. Participants' comments and observations on their transcripts will be noted during member checking while appropriate edits are made to agree with their thought.

Furthermore, I ensured data saturation to ensure credibility through information convergence at a point when new data collected adds no additional value to the existing results. Researchers use data saturation to ascertain reliability and validity (Adekola et al., 2023). Also, I used the within-method data triangulation technique to collect qualitative data from multiple sources to ensure data saturation. Data saturation was assured after collection of sufficient data to draw conclusions such that additional data added no more valuable information (Guest et al., 2020).

Transferability

Transferability is how the qualitative researcher demonstrates that the research findings are applicable to other contexts such as similar situations, populations, and phenomena. A study is transferable when the results apply to many different types of people or different situations. The more widely applicable the result of the research is, the better and the more transferable it becomes.

Therefore, to increase transferability, I ensured that my study sample size was representative of the population such that the former possesses the characteristics relevant to the research phenomena. Also, I defined my population in detail and ensured that my sample size is adequate to answer the research questions and produce sufficient data to attain saturation; and that the participants are knowledgeable about the research phenomena being investigated. Jones and Donmoyer (2021) insisted that it is incumbent on the researcher to provide evidence of transferability. In line with this, Pschenitza et al. (2021) reiterated that the researcher can ensure transferability by providing a thorough description of the study so that future researchers can decipher the transferability of its findings to another research.

In addition, I provided in-depth narrative of the study background, identified, and stated the research limitations and avoid sampling biases. Transferability is one of the criteria for assessing and establishing the quality of a study (Holter, 2022).

Confirmability

Confirmability is the degree to which research findings could be confirmed by other people; confirmability establishes that the study data and its findings were based on the facts of the research process and not on bias.

In this study, I ensured confirmability by using data collection and analysis techniques that aligned with the research method and design. I collected data from reliable sources and the data was thoroughly assessed and verified for validity to ensure that the findings are repeatable. Also, I ensured confirmability by maintaining a comprehensive documentation of the research data collection process during the interview sessions and data analysis. Detailed documentation outlining the study assumptions, methods and techniques used with underpinning decisions are crucial for establishing confirmability (Adekola et al., 2023). To ensure confirmability by making sure that this research findings truly reflect the experiences of the interviewees rather than the preconceptions of the researcher thereby eliminating bias.

Another qualitative study concept that I used to ensure confirmability is member checking; participants were allowed to confirm that the data collected, and my interpretation of the data were correct. Confirmability is a concept used to ascertain that the data collected reflect the research subjects' views without introducing bias (Arnold et al., 2023).

Using triangulation concept, I collected data from multiple sources to establish themes and subthemes till saturation was reached and inferences drawn; this ensured that my findings were based on the views of the participants thus eliciting confirmability.

Triangulation ensures different sources of data to reach saturation confirming data integrity resulting in validity and reliability (Holter, 2022).

Transition and Summary

The purpose of this qualitative pragmatic inquiry study was to explore the strategies used by the Nigerian government IT project managers to implement e-government projects. In Section 2 of this study, I restated the purpose statement, enumerated my role as the researcher and primary data collection instrument. I stated the ethical requirements followed in this study, defined the participants, the research design and methods, population and sampling, data collection and data analysis techniques. I also discussed reliability, and validation. In Section 3, I discussed the presentation of findings, application to professional practice and implications for social change, and recommendations for further research.

Section 3: Application to Professional Practice and Implications for Change

The purpose of this qualitative pragmatic inquiry study was to explore the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems. In this section, I discussed the study findings and described how this study may contribute to the field of information technology and positive social change. I also made recommendations for future research coupled with salient reflections impacting the study.

Overview of Study

The purpose of this qualitative pragmatic inquiry study was to explore the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems. I utilized semi-structured interviews with open-ended interview questions to collect data from participants selected from different organizations that were trailblazers in designing and developing useful and useable e-government systems in Nigeria. Apart from my field notes and reflective journals, I collected data from other secondary sources by the review and analysis of documents (listed in Table 2 below) from public sources pertaining to e-government design, development, regulations, and implementation ecosystem. From the data analysis, the findings from this study revealed the following four major themes that reinforce the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems: (a) theme 1: user-centered design and development strategy, (b) theme 2: engaging end-user feedback in e-government design and development, (c) theme 3: the importance of simple system

abstract design and development, and (d) theme 4: Following industry best practices in e-government system development processes.

Table 1

Secondary Data Source - Documents and Their Codes

S/No.	Document	Document code
1	Nigeria e-Government Interoperability Framework (Ne-GIF)	DOC1
2	Information And Communication Technology (ICT) Adoption In Tertiary Institutions	DOC2
3	The E-government Handbook for Developing Countries	DOC3
4	Statistical analysis of software development models by six-pointed star framework	DOC4
5	Manual for Measuring E-government	DOC5
6	Compendium of Innovative E-government Practices	DOC6
7	Nigerian Government Enterprise Architecture	DOC7
8	Critical And Emerging Technologies List Update	DOC8

Presentation of Findings

The overarching research question was what strategies do Nigerian government IT project managers use for designing and developing useful and usable e-government systems? Having obtained IRB approval, #10-18-23-1058318, I recruited 12 experienced and eligible participants who were Nigerian government IT project managers employed with medium and large-sized organizations including government institutions located in Lagos State of Nigeria. Each of the participants has a minimum of six years cognate experience of strategies for designing and developing useful and useable e-

government projects in Nigeria, and with skills to bridge design-reality gap and ensure seamless technology adoption. A sample size of 12 was adequate to generate enough data required to exhaustively answer the research question and to attain data saturation thereby establishing validity.

I utilized semi-structured interviews with open-ended interview questions to collect data from participants from seven different organizations that were trailblazers in designing and developing useful and useable e-government systems. I conducted the interviews online until there was no new information provided thereby confirming data saturation with the eleventh participant. I also collected secondary data from the review and analysis of documents from public sources pertaining to the FGN's e-government design, regulation, and implementation ecosystem.

At the end of the interview sessions, I did data analysis by transcribing the digital recordings and analyzed the data while masking each participant with a unique pseudonym; and I utilized member checking, thematic analysis, and the within-methodological triangulation approach to identify the following themes as this study findings.

Theme 1: User-Centered Design and Development Strategy

An emergent theme from data analysis of this study is User-Centered System Design and Development Strategy; the responses of all participants revealed that user-centered system design and development strategy is crucial to creating a useful and usable e-government system. In a user-centered design, system designers and developers focus on understanding users' requirements, pain points, and culture and incorporate the

solutions in each phase of the design and development processes. User-centered or user-driven design is an iterative process used to test and evaluate e-government systems to ascertain they meet all user requirements resulting in a satisfactory useful, and usable system stimulating wide engagement with overwhelming end-user adoption.

User-centered system design and development consists of the following vital components to create useful, and usable e-government systems:

- Securing end-users buy-in,
- Adherence to the process of user-centered design and development,
- Understanding user requirements and pain points,
- Attention to users' socio-cultural and literacy backgrounds,
- Design and development of user-friendly, useful, and usable system.

Table 2 below shows the above components and the number of participants who testified to their engagement and validity for creating user-centered systems. The table also shows the number of supporting documents for the Theme 1 components.

Table 2

User-Centered Design and Development Strategy

Components/ frequency	Securing end- users' buy-in	Adherence to the process of user- centered design and development	Understanding users' requirements and pain points	Attention to users' socio- cultural and literacy backgrounds	Design and development of simple, user- friendly, useful, and useable system
Participants	11	12	12	10	11

Documents	7	8	8	5	8
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Subtheme - Securing End-Users' Buy-In

A major component of user-centered system design that cut across the participants' comments was the importance of securing stakeholders' buy-in. According to the Project Management Institute, project stakeholders are "individuals and organizations who are actively involved in the project, or whose interests may be positively or negatively affected as a result of project execution or successful project completion" (Project Management Institute, 2021). P-5 and P-7 said that securing end-users' buy-in resulted in easier project management process, it promoted synergy among project team members and strong commitment which was critical for accurate and complete scope definition. P-3 reckoned that "involving end-users in decision-making and implementation of the system endeared the system to them, perceiving the system as their own rather than a system imposed on them; this influenced their positive perception of the e-government system and motivated their adoption."

Also, participants emphasized that securing the buy-in of the financial institutions (participating banks through whose networks e-government service charges were processed) enhanced seamless collaboration between the banks' technical team and e-government designers to jointly design secure interfaces between the banks' payment engine and the e-government application systems" P-1; P8, and P11).

Subtheme - Adherence to User-Centered Design Process

Participants also indicated the importance of strict adherence to the process of creating user-centered systems as vital to turning out a useful and usable system. The following four-step guidelines are utilized by system designers in creating quality user-centered design.

- a. **Understanding the Users:** An effective user-centered design can only be created when the designer and developer understand the users' goals, and motivations for using the system. A clear picture of users' challenges, skills, behaviors, and needs is obtained through dialogue and interactive sessions with end-users. At this stage, P-1 said, "We also carried out research to know the medium that various users prefer to interact with the system, desktops, laptops, smartphones, etc. The e-government system designers incorporated these elements into the design solutions which were tailored to meet end-users' needs".
- b. **Define User Requirements:** Having understood the end-users characteristics, P-10 and P-12 said they defined clear user requirements, incorporated user expectations, the scope of the design, specified deliverables, milestones, and noted the success factors to create user-centered system.
- c. **Create Design Solutions:** Design the system features based on the requirements gathered, specify user and process flow, define information architecture, decide on colors, language, icons, access controls, and onboarding process. P-6 and P-9 submitted that they achieved user-centered

systems by ensuring that system design was informed by the knowledge of end-users and their needs.

- d. **System Evaluation:** Evaluation of the designed solutions is carried out to ascertain the achievement of the set goals in component three. In usability tests, the system results are compared to ascertain it meets the defined requirements. Test for what can be improved, users' verbal and non-verbal responses are crucial to creating a system that delivers satisfaction to the users (P-4).

Subtheme - Understanding of User Requirements

User-centered design and development approach is all about end-users' satisfaction propelling e-government stakeholders to dig deeper to gain an understanding of users' requirements, behaviors, challenges, and feelings with a view to creating digital value by addressing the requirements to meet users' needs thereby motivating engagement and technology adoption. This helps system designers and developers to premise the emerging e-government system on an explicit understanding of users' needs and environment (Vargas, 2020). All the twelve participants recognized that a good understanding of end-users' requirements is the bedrock for building user-centered design and development strategies.

Subtheme - Attention to Users' Socio-cultural and Literacy Backgrounds

Also, consideration of various users' abilities in terms of their socio-cultural nature and literacy status were adjudged as imperatives that should be factored into creating a user-centered design of a useful e-government system. To achieve a user-

centered design, end-users should be involved in all key system design and development stages (P-1; P-5, and P-9). Users involved should be knowledgeable about e-government systems functionalities since they serve as representatives of the larger society who will eventually use the digital platform.

In the rural hinterland parts of Nigeria where literacy level is low, eight of the 12 participants, P-1, P-2, P-4, P-7, P-9, P-10, P-11, and P-12, said that “they reached out to and engaged the users to study their challenges, socio-cultural and environmental peculiarities and to collate their requirements after which they devised customized solutions as inputs into the user-centered design and development process of the e-government systems”. Involvement of end-users in the solutions design and development process positively influenced them to accept the e-government system. Additionally, all the twelve participants noted that system designers and developers should have a deep understanding of users, who they are, their behavioral patterns, characteristics of the market segments they operate, their literacy levels, and their service needs based on which designer and developers can create e-governments that is useful and easy usable.

Table 2 also shows that eleven out of twelve participants emphasized that simple, easily understandable user-friendly solutions are pivotal to achieving user-centered design and development strategy. P-2, P-5, and P-9 added that “we design simple menus and incorporate language translator to switch to any of the major Nigerian local languages, especially Pidgin English (a local English language widely spoken by high population in West Africa including Nigeria) as a method of achieving user-centered system design and development”. Ten of the twelve participants were

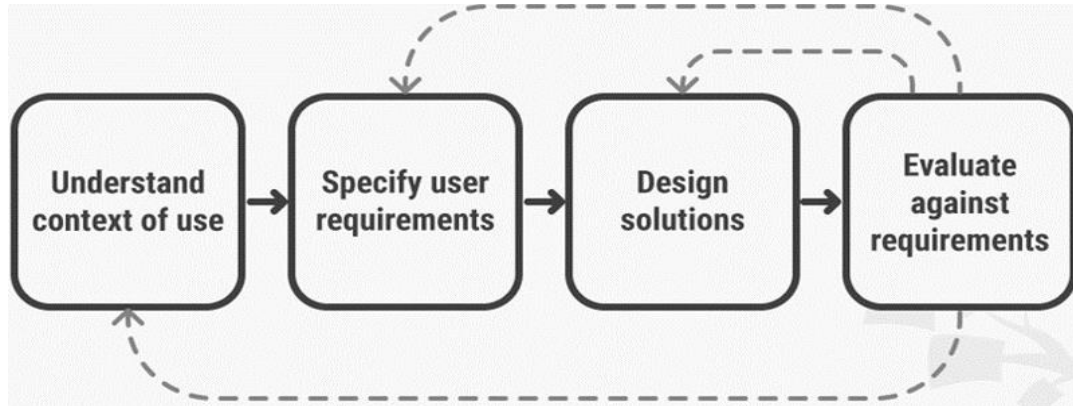
unanimous that carrying out system education and awareness sessions were potent instrument used to gain end-users buy-in, this assisted in designing user-centered systems. Some participants reckoned that “in various communities, we leveraged the use of the state government community town halls to meet with and engage users to drive penetration and adoption of the e-government system” (P-1, P-7, and P-11). Interactive awareness sessions were held with users where the benefits of the system were discussed, and brief training sessions were held (P12). In the interactive sessions, users were allowed to ask questions and give feedback, suggestions were sought from users for appropriate solutions they thought would work best for them regarding the challenges faced. A better understanding of users’ challenges and requirements through face-to-face interactive sessions in their local communities helped in creating user-centered system designs producing useful and useable e-government platforms (P-5, P7, and P-11). P-3 and P-6 submitted that “before we left the user community interactive sessions, end-users were glaringly excited and eager to adopt the system since they were part of the design process”.

P-3 recognized that objectively addressing the concerns or feedback from the end-users encourages them, making them feel valued thereby fostering collaboration and a stronger commitment to designing and developing useful and usable e-government systems. P-1 argued that “involving key players who have in-depth knowledge of e-government process dynamics and understanding of the challenges and gaps guarantee effective user-centered design bridging design-reality gap culminating in a flexible, user-friendly system.

P-5, P-8, and P-12 advised that for the system to be useful and useable to all, and irrespective of their literacy status, system design and development should be made simple and easy to understand such that the low literate user community can use the system without requiring a guide or assistance. To adequately cater for the low literate and digitally non-savvy users, P-7 and P-11 suggested innovative design solutions incorporating simple menus with not more than 3-clicks from initiation to completion of a service request on the e-government system; in addition, leveraging simple mobile phone features and facilities such as unstructured supplementary service data (USSD) can motivate end-user adoption.

Subtheme - Design and Development of User-friendly, Useful and Useable System

Vincalek et al. (2021) indicated that user-centered system design and development process is a four-step iterative process beginning with (i) understanding the context, (ii) detailed gathering of users' requirements, then (iii) user-centered solutions are designed and developed, followed by (iv) system evaluation where the results of the system are assessed and compared against users' requirements to determine how close to users' needs the results are. A series of iterations are performed in the process until the system requirement gaps are closed thereby meeting users' needs and bridging design-reality gap. Designed and developed systems are tested, redesigned, and redeveloped until a useful, usable, and satisfactory system evolves.

Figure 3*Iterative User-Centered System Design Process*

A simple and user-friendly solution will ensue by engaging experts and utilizing standard design guidelines in the e-government system design and evaluation process (Dhore et al., 2023). P-2 confirmed that “we involve end-users in our design evaluation phase to span the entire user experience; also, a simple, reliable and user-friendly design evaluation results require a sufficiently long time for a robust, efficient and acceptable e-government system to emerge.”

P-3, P-8, and P-10 said, “To achieve a user-centric e-government system design and development, we ensured that our design testing team involved multidisciplinary members including end-users in each phase of the design process to critique the system, spot the processes that functioned well, what did not and why?” End-users easily spot areas of the design that require tweaking, and that are often overlooked by system designers and developers, engendering usability and accessibility. Deeper user involvement ensures system designs are more likely to meet users’ requirements, it

becomes easier for system designers and developers to create user-centered design tailored for users with specific peculiarities with a sense of empathy. User-centered design and development helps to satisfy users of various categories giving designers more insights into cultural diversity and users' values.

Some e-government systems require online payments of service charges for their services requested by end-users, such sensitive online transactions require traffic to be routed through the payment engine of the intermediary banks powered by a transaction switching company; the e-government system architects, designers, and developers must have a thorough understanding of the process flow and integration dynamics. Loss of funds or untraceable payments is a major factor that discourages e-government system usage, therefore, requires user-centric system design and development to utilize flexible and reliable designs and efficient processing to achieve seamless integration between the payment engine and transaction switching gateway. Achieving useful and usable e-government systems requires user-focused design that processes online payments accurately boosting users' confidence in the system (P-11). A major concern of end-users is security; user-centered design and development should embed information security and privacy strategies in the system design and development process to protect users, avoid data breaches, enjoy stakeholder trust and wider adoption (P-5, P-6, and P-8).

A major e-government system challenge in Nigeria is infrastructure deficit such as internet glitches, and erratic power supplies which commonly result in transaction failures; user-focused design helps design and embed automatic account reconciliation module as part of the e-government system architecture. "Algorithms were built to filter

all transactions and identify failed or duplicated payments in the financial database, the design automatically reverses failed payments into end-users' accounts accompanied with appropriate narratives while successful payments are marked 'payment received' (P-1, P4, & P-5)." User-centered design removes end-user apprehension over failed transactions and ensures satisfaction and increased patronage of e-government systems (P-4).

These findings are consistent with TAM in that user-centered system design and development boosts confidence, security, and trust since users can achieve their service targets as desired while increasing their productivity. User-centered design engenders useful and usable e-government systems influencing positive user attitudes to accept and use the system; therefore, the findings are consistent with TAM concept. TAM is an information systems theory that explains the factors that influence the decision of technology users to accept and use technology. TAM posits that two elements, PU and PEOU determine users' decision to use a system (Davis, 1989). The easier a system is to use, the more people would want to use it. If a technology is not user-friendly, this will affect the users' positive attitude towards it. User-centered design makes the e-government system simple, user-friendly, and easy to use; therefore, Theme 2 aligns with TAM concepts and grounds this research phenomenon.

I achieved triangulation in that eight of the documents reviewed are consistent with this theme – utilizing user-centered design and development strategy helps create quality, useful, and usable e-government systems. The documents supporting the theme consist of e-government handbook for developing countries, statistical analysis of

software development models by six-pointed star framework, Nigeria e-government interoperability framework, e-government development regulation and compendium of innovative e-government practices. The documents illustrated that end-user requirements gathering gives insights on what design process to deliver user satisfaction motivating system engagement and adoption. The document on e-government handbook for developing countries emphasized that requirements gathering is a twofold step involving business or functional requirements and technical requirements, and it entails connection with different stakeholders to understand their pain points and needs to create a user-centered design. I also reviewed the manual for measuring e-government which specified amongst other things, that e-government system must be user-focused for it to be useful and usable.

As shown in Table 2, seven of the eight documents reviewed contained information consistent with user-centered design and development, eight documents contained information related to the importance of an in-depth understanding of user requirements, eight documents were supportive of design and development of a simple, user-friendly system to gain usability and usefulness. Each of the documents reviewed has information consistent with all the above components of user-centered design strategy.

A recent study stressed that user-centered design forces designers to understand user requirements making end-users a central part of the design and development process leading to useful and usable systems and contributing to its acceptance (Vincalek et al., 2021). Listening to end-users amplifies their needs and boosts

designers' understanding as this may provide spot-on information not revealed during interviews with participants. This theme supports Banat et al.'s (2023) study, which noted that the system designer and developer are to ensure simplicity and an easy learning curve to use the system, and that long system manuals are not user centered. Schütze et al. (2023) further noted that system manuals should be brief and system functionality should be drawn from end-users' worldview.

In his study, Vargas (2020) advised system designers and developers to consider using five simple points to create user-centered design: (i) making design simple and easily understandable, (ii) end-users easily determine the next actions, (iii) making results of actions and conceptual model visible, (iv) foster easy evaluation of the current state of the system, distinguish intentions from the required actions. Contributing to this, Capsi-Morales et al. (2023) articulated a similar set of principles while (Hennig et al., 2023) indicated that the concepts confirm that user-centered design and development strategy produces acceptability usefulness and usability.

User-centered design includes iterative usability testing using empirical measurement to confirm user needs are met, iterative design and testing require many pilot tests before releasing the e-government system to production. Designers and developers pay attention to the feedback from pre-go-live tests as they identify measurable usability to address efficiency, security, and privacy issues. The above studies are consistent with those in my literature review and are consistent with TAM concepts, PU and PEOU, because user-centered design and development positively

impacts a degree of end-users' attitude toward PU and perceived ease of use of the e-government system.

Therefore, this theme provides one of the answers to the research question because user-centered system design and development engenders useful and usable systems. Also, the theme supports TAM theory as the conceptual framework for this study. Furthermore, all twelve participants indicated that user-centered design and development strategy produces a useful and usable e-government system.

Theme 2: Engaging End-User Feedback in E-Government Design and Development

Another finding that emerged from the data analysis and was prevalent in the participants' responses is the importance of user feedback in the design and development of useful and usable e-government systems. Each participant emphasized that regular feedback from the stakeholders was an important aspect of their design and development process to create useful and usable e-government systems. To design and develop the e-government system features in line with users' perspectives, all the participants indicated that they used various media, listed below, to collect feedback from different users and other stakeholders regarding their thoughts, and perceptions of the system. Collecting informative feedback from e-government users entails the following four components shown in Table 2 below including the number of participants who indicated user feedback as important in turning out useful and usable system.

- Obtaining feedback through the e-government application page.
- Feedback through meetings with end-users.
- Feedback via phone calls, emails to helpdesk.

- Feedback through social media.

Tabel 3 also shows the number of documents reviewed and the frequencies that contained the components as essential e-government system design and development tools. Note that the frequency is not mutually exclusive.

Table 3

Engaging End-User Feedback in E-Government Design and Development

Components/ frequency	Feedback through the e- government application page	Feedback through organized meetings with end-users	Feedback through phone calls, emails to helpdesk	Feedback through the social media
Participants	12	11	8	10
Documents	6	7	5	5

All the twelve participants said that the feedback received served as a valuable input to their current and future e-government system design and development to enhance customer satisfaction and boost adoption. Eleven of the twelve participants indicated that they obtained honest and valuable feedback via periodic engagement sessions with end-users where feedback was obtained on each service and module of the e-government system. Participants illustrated that feedback should be planned to encompass all the modules, features, functionalities, and services of the e-government system; this strategy helps to measure and optimize the usefulness and usability of all the services provided by the system to meet user needs and foster engagement. P-2 and P-5 said that some users preferred to be anonymous, therefore, administration of

questionnaires were utilized to extract important feedback used by system designers and developers to create robust systems that meet user needs.

All the participants indicated that they “engaged third-party firms to use the system in different scenarios and to provide honest feedback which the e-government designers and developers incorporate into the current and future deployment processes”. E-government project managers assessed and acknowledged usefulness and useability based on end-users’ experience and their candid feedback (P8; P-7, and P-12); also, participants revealed that honest feedback were obtained by recruiting users who were not acquainted with the e-government system environment to test the system, and to gauge its user-friendliness and usefulness. According to P-1; P-6, and P-10, obtaining feedback from the experience of users who have not interacted with or navigated the system before without requiring direction or guidance was an effective way of evaluating the usefulness, usability, and user friendliness of the e-government system. Iterative evaluation of the system and ensuring that end-user feedback is appropriately implemented produces improved system meeting user satisfaction. This is consistent with Alyoussef and Al-Rahmi’s (2022) research in the literature review, that proper testing provides valuable feedback which helps designers gain actionable insights with which to make positive changes to the system that meet user needs.

In their interviews, P-4, P-5, P-7, and P-11 emphasized that proper understanding of feedback is crucial to develop useful and usable systems that cater for users’ needs. This assertion is consistent with this theme and a similar study by Park et al. (2022) whose finding emphasizes that user-centric approach to system development

prioritizes user satisfaction by utilizing feedback to optimize the system to meet user needs. Also, participants affirmed that obtaining feedback cut across all segments of stakeholders, the literate, semi-literate and illiterate, especially those who do not understand English language - to understand their pain points, the solution of which was targeted to enhance user-centered design and wider adoption (P-1, P-2, and P-9). Park et al. (2022) added that e-government reviews should involve different stakeholders of varying literacy levels and lingual understanding to provide feedback stimulating system optimizations that cater for the needs at all levels of end-users and positively affecting overall system performance and user-friendliness. Seven participants recommended that building a language translator – a system that allows options for major Nigerian local languages, especially Pidgin English which is widely spoken by the literate and illiterate user community, enhances system design flexible breaking language barriers engendering wider adoption.

Having noted that data security is a key concern that cuts across various segments of e-government users, P-1, P-2, P-5, P-8, and P-12 emphasized that “deliberate plans for obtaining feedback on the level of satisfaction with the system security were made during community user engagement sessions and through sending of information security teasers to users via short message service (SMS) or text messaging on their mobile phones and emails.” As a means of getting more feedback from users who call the help desk for technical assistance, eight of the twelve participants confirmed that their help desk team had been trained to ask questions on how satisfied callers/users are with the system performance, speed of processing and

accuracy, reporting and others; this is to prompt feedback that will help designers and developers optimize the system to elucidate useful and usable system.

Ten participants claimed receiving more feedback through social media since virtually every literate and semiliterate e-government systems user has at least one social media account. P-12 confirmed that “social media is a platform where honest and valuable feedback was received, being a platform where people express their honest opinion freely without being teleguided or having minding of consequences.” P-7 and P-9 stated that taking the feedback in good faith and making deliberate remediation efforts through review and upgrade of the system design helps turn out a useful and user-centric e-government system. From the data analysis, all the participants obtained feedback from the e-government system customer satisfaction survey page; P-5 emphasized that “the feedback obtained through the user satisfaction survey page mostly conveys honest and valuable information on user experience because users were prompted for feedback before they log out of the system”. Since the experience is still fresh in their memory at that point, the feedback reflects and conveys the candid opinions and experience of the users.

This finding aligns with Günçan and Onay’s (2021) in the literature review that, feedback provides project managers vital information about user expectations and requirements helping application developers avoid development flaws, by using informed decisions and accurate assumptions of user needs to create innovative e-government systems thereby increase useability and usefulness.

This theme is supported by a recent study of Ochieng et al. (2022), the finding of which affirmed that obtaining feedback makes it easier for developers to pinpoint end-users' problems and to design appropriate fixes to enhance the overall user experience and to increase system adoption. Another recent study supporting this theme stated that prioritizing and providing user focused e-government system ensures productive use of time and deployment of resources to create systems that provide value and benefits to end-users (Iqbal et al., 2022). E-government project managers seek close collaboration with designers, developers, and users to get feedback to avoid development flaws thereby spurring useful and usable systems. In their study, Pschenitza et al. (2021) argued that balancing speed and quality when feedback is addressed is crucial in creating useful and usable systems. Elaborating on this, Georgiou et al. (2020) said, although software updates used to take months which may run into years during which end-users may deflect to alternative solutions that are readily available, however, harnessing end-user feedback, backed by user-focused system design, can reduce developers' turnaround time while delivering more robust systems with value. Szabó and Hercegfi (2023) advised that having a detailed criteria for creating useful and usable systems coupled with that for obtaining valuable feedback should be part of system design and development life cycle; this proactive approach stimulates quick adaptation to dynamic changes in user requirements resulting in user-focused systems. Corroborating the above fact, Silva-Vásquez et al. (2022) advocated that developers need not wait till the application is near completion; getting feedback at

early stages of the system design and development processes improves the application deliverables.

Having reviewed the identified documents consistent with this theme, I achieved triangulation in that seven of the documents reviewed indicated the importance of user feedback as essential to the design and development of useful and usable e-government system. The document, compendium of innovative e-government practices, states that periodic gathering of end-user feedback and incorporating the solutions in the design and development processes produces systems that positively affect the users. Other documents reviewed illustrated that obtaining feedback stimulates optimized systems that meet users' needs. As shown in Table 3 above, six of the eight documents reviewed supported online gathering of user feedback through the system application survey page as an effective way of getting information about the state of the system. Eight documents contained information consistent with obtaining feedback via unstructured user engagement interactions and administration of questionnaires, five documents were supportive of the effectiveness of obtaining feedback through phone calls and emails and using the helpdesk agents to ask questions prompting important feedback from users. Five documents are supportive of gathering feedback from social media such as Facebook, LinkedIn, Instagram, and YouTube to create user-friendly system to gain usability and usefulness.

End-user feedback is an iterative process which should be obtained regularly in as much as the system is live until system operational efficiency, confirmed by establishing its usefulness, usability, is achieved. This is consistent with participants'

views that “there is no end to system reviews and feedback if the project manager wants the system to keep being in demand and use” (P-2, P-6, P-7, and P-11).

This theme, emphasizing the importance of end-user feedback in strategies for designing and developing useful and usable e-government systems, also supports the findings of previous researchers on the importance of feedback to creating scalable and flexible systems. According to Correa and Silveira (2023), end-users’ feedback in terms of features required to make the system useful and acceptable should be considered and built in the design and deployment of the system. Türker et al. (2022) established that user feedback should be obtained across all geographies and demographic strata engaging the e-government platform; that although feedback may be different due to literacy level, environment, and socio-cultural inclination of the users, all of them should be addressed to create innovative systems to end-users’ delight. Günçan and Onay (2021) concluded that satisfactory implementation in terms of technical requirements is not enough for an information system to be useful and usable, incorporating solutions to address end-user feedback is necessary to guaranty usefulness and usability.

This theme is also consistent with TAM concept, the conceptual framework for this study, which specified that considering and addressing end-users’ feedback positively improves the flexibility of the system thereby creating useful and usable technology influencing users’ intention to use the technology. According to the TAM, the higher the PU and PEOU of a system, the higher the end-users’ motivation, and positive attitude to use the system (Jo & Park, 2021). TAM establishes that PU and perceived ease of use,

resulting in increased performance and productivity, are the factors that influence end users' attitude to accept, adopt and use a system.

This theme is supported by recent studies; Georgiou et al. (2020) concluded that although e-government systems design and development are rigorous processes, proof of usefulness and usability is positive feedback from stakeholders. Feedback is a means of providing developers with information detailing the challenges faced in the use of an application or suggestions to optimize the system. Iqbal et al. (2022) expounded that understanding of feedback is crucial to providing appropriate solutions; therefore, seeing from the users' perspectives requires proper stakeholder engagement. Deep understanding of the feedback helps developers to apply innovative changes to improve the quality of the software. Türker et al. (2022), another recent study that supports this theme, indicated that ensuring system usefulness and usability entails that e-government designers and developers ascertain correct understanding of feedback received and focus their testing process to validate achievement of users' needs in an interactive and iterative process until end-users' are satisfied with the output.

According to Iqbal et al. (2022), gathering feedback with a view to augmenting and optimizing the system to achieve user satisfaction is an empathetic gesture from the developers to end-users and other stakeholder; showing empathy to achieve user satisfaction can influence users' intentions and positive attitudes to use the system. Therefore, Iqbal et al. (2022) assertion further reinforces that this theme is consistent with and supports TAM.

Buttressing this, Nisar et al. (2021) pointed out that system designers and developers engage in obtaining end-user feedback as an essential strategy to create useful and usable systems improving adoption. P-1, P-4, and P-7 indicated that continuous gathering of feedback reveals the feelings and perception of end-users, and prompts system refinement that produces customized and stable system. Engaging end-user feedback in all facets of e-government system design and development is a vital requirement and a potent building block for creating user-centric system with preference for aligning the system features and functionalities to satisfy user needs, influencing users' PU and PEOU; therefore, this theme aligns with TAM concept. Therefore, the importance of end-user feedback strategy in achieving a useful and usable e-government system cannot be overemphasized. From the data analysis this finding and theme provide an answer to the research question for this study in that all the participants' responses resonate with and viewed feedback as a critical part of strategies used to design and develop useful and usable e-government systems in Nigeria.

Theme 3: The Importance of Simple System Design and Development

Another theme that emerged out of data analysis and supported by all the participants and documents reviewed is the importance of developing simple e-government design. All the participants indicated that maintaining simplicity in e-government systems design is essential for creating useful, and usable systems that are user-friendly, easy to understand, and motivate adoption. P-3 commented that, unlike before, end-users are better informed, and their value for simple e-government systems has increased. Supporting P-3's submission, P-7, P-8, and P-12 confirmed that "simple

designs using structured codes such that system screens - desktops, laptops, or mobile device screens, are not clustered with much information are easy to use.” P-7 added that “simple designs such that application look-and-feel menus is attractive while information is displayed on the screen conspicuously against a compatible background color are easy to us.” These designs are meant to create systems that are user-friendly with enhanced productivity and improved efficiency. Applying simplicity in strategies for designing and developing useful and usable e-government systems encompass the following seven components:

- Clear requirements definition.
- Modular design.
- Prioritize simplicity.
- Utilize abstraction approach.
- Implement rigorous testing.
- Embrace source code refactoring.
- Detailed code documentation.

Table 4 below shows the number of participants who indicated that simple design approach was important for creating useful and usable systems and the frequency.

Table 4 also shows the number of documents reviewed and the frequencies that contained the components mentioned as essential to simple e-government design. Note that the frequencies are not mutually exclusive (see Table 1 above for the list of documents reviewed).

Table 4*Implement Simple System Design and Development*

Components / frequency	Obtain clear requirement definition	Utilize modular design	Prioritize simple design	Utilize abstraction design technique	Conduct rigorous testing	Source code refactoring	Detailed code documentation
Participants	9	11	12	7	9	8	10
documents	6	7	8	5	8	7	8

Subtheme – Obtain Clear Requirements Definition

Nine out of 12 participants confirmed that obtaining clear, succinct, and unambiguous requirements definition was a valuable starting step for ensuring simple system design and development. P-1, P-3, and P-9 claimed that adopting simple design and code development principles were essential to creating a high-quality e-government system with scalable, maintainable, and reliable features. A clear, and complete requirements definition is an important precursor for achieving simple application designs (P-1 and P-4). P-8 said, “simple designs are easy to maintain when requirements are approved, and scope creep avoided to prevent complexities during development”. Documentation of requirements and process flows are essential to establish design and development roadmap while continuous monitoring and strict adherence to project scope are ensured to avoid deviations from the design (P-7, P-1, and P-12). The participants indicated that e-government systems are designed with attractive and less reflective screen colors so that information displayed are visible to end-users. For mobile phone users, it is part of simplicity strategy to ensure the design of the e-government application screen size is compatible with IOS and Android

devices and to automatically adjust itself to fit into the users' mobile screens thereby increasing usefulness, and useability driven by simple designs.

Subtheme - Utilize Modular Design

Eleven participants attested that they used modularized design to maintain application simplicity, ensure ease of use and encourage adoption. Participants explained that modular design approach allowed splitting the e-government application functionalities into smaller manageable modules; each module was designed and developed to anchor a set of similar functions while all the modules were eventually coupled together enhancing simplicity, readability, maintainability, and ease of modification. While attesting to this, P-7 added that with modular design, system maintenance affects only the module concerned without tampering with other aspects of the system thereby minimizing downtime. Modular design makes it easy to identify and fix code bugs or application errors with short maintenance window and less system downtime (P-3, P-9, and P-12).

However, participants indicated that designers must be intentional to gain users' attention and positive perception of the system, P-6 affirmed that they "addressed perception requirements by prioritizing simplicity in their design such that in each service request, users do not have to do more than three clicks from service initiation to completion of the task". Simple e-government systems are designed to be intelligent and intuitive such that it is easy to intuitively decipher the next steps of actions without requiring assistance or a guide as users navigate the system (P-1, P-5, and P-7).

Subtheme - Utilizing Abstraction Design Technique

Seven participants indicated utilizing abstraction design technique was a key requirement for creating simple, useful and usable e-government systems. System developers adopt coding abstraction as a system development approach to hide background details from users while projecting and displaying only useful and important objects on the screen (P-3 and P-11). With the application of abstraction techniques, complexity is removed guaranteeing simple, easy to use and user-friendly systems. E-government system designers and developers utilize abstraction to simplify and beautify the application look-and-feel displaying only necessary information in a format easy to use and understand by all classes of users, irrespective of their literacy levels (P-4 and P-9). Corroborating this, P-8 and P-10 said, maintaining simplicity in e-government entailed focusing on coding concepts that are easy to understand, modify and maintain. In their responses, P-5, P-6, and P-8 stressed that simple design and development prevents ambiguity, enhances developers' understanding of the codes, spurring ease of maintenance thereby reducing errors and bugs.

Subtheme – Conduct Rigorous Testing

Nine participants affirmed that rigorous testing has a high impact and is inevitable in developing strategies for designing and developing useful and usable e-government systems. While testing helps to ascertain the usefulness and usability of the system, it is also a process used to confirm if the system meets the desired user requirements (Brack et al., 2022). P-5 emphasized that testing is an iterative process that they used for early detection of coding bugs and application errors; P-3 and P-9 highlighted that identifying

bugs early affords developers opportunity to correct the errors before go-live thereby proactively managing user expectations and improving acceptance at go-live. Testing should encompass all the system processes, workflows, and services to produce a flexible and robust e-governments system (P-1).

Subtheme – Importance of Source Code Refactoring

Regarding leveraging refactoring technique to create simple solution designs, eight participants alluded that embracing source code refactoring was an important requirement for creating simple e-government systems. This theme is consistent with existing literature; Demircan and Acarbay's (2022) work revealed that refactoring is valuable for maintaining source codes quality and efficient system performance thereby avoiding e-government application complexities. P-2 added that "refactoring identifies complexities in source codes and reconstructs the internal structures to form a simple, and usable system architecture." Georgiou et al. (2020) argued that simplicity in source codes can be guaranteed by using refactoring to frequently restructure and reconstruct source codes without tampering with the system functionality until the simplest design is achieved. However, participants also indicated that impactful refactoring of e-government system codes is not complete without conducting rigorous unit testing, else, the system will be prone to multiple errors. Although Hunter-Zinck et al. (2021) noted that unstructured and unplanned refactoring could affect other components of the system that have been functioning well, non-refactoring of codes usually results in complex unusable systems. P-6, P-8, P-9, and P-11 also highlighted that they used refactoring to produce simple high-performance application through frequent review of the application

codes thereby ensuring simplicity, improved code quality while achieving efficient e-government system architecture.

Subtheme - Detailed Code Documentation

Ten participants attested that using detailed documentation of the system codes, workflows and processes is a vital tool for creating simplicity, ensuring usefulness, ease of use, and motivating adoption. P-7 said, although often overlooked, code documentation is imperative for ease of support and upgrade; properly documented codes, API and system architecture provides insights into the structure and functionality of the e-government system. Usefulness and usability can be determined by positive user experience; therefore, simplifying e-government design and functionality makes it easier for users to understand, navigate and use the system.

I achieved triangulation in that seven of the documents reviewed are supportive of this theme, that focusing on simple designs provides useful and usable e-government systems. The documents supporting this theme consist of critical and emerging technologies list update, ICT adoption in tertiary institutions, statistical analysis of software development models by six-pointed star framework, Nigeria e-government interoperability framework, e-government development regulation and the Nigerian government enterprise architecture. The documents illustrated that as technology is increasingly integrated into daily life, designing, and developing simple systems will create value for users. The documents, Nigerian government enterprise architecture and statistical analysis of software development models by six-pointed star framework, illustrated that in view of the high Nigerian population with divergent languages and

literacy levels, incorporating simplicity in e-government designs is inevitable to create useful and useable systems.

As indicated in Table 4, all the documents reviewed contained information consistent with prioritizing simplicity in system development; six documents contained information highlighting clear requirements definition as a vital component for creating simple applications, seven documents were supportive of modular design; five documents emphasized code abstraction, eight and seven documents stressed that rigorous system testing, and source code refactoring respectively are crucial to maintaining simple systems to gain usability and usefulness.

The above findings are consistent with the concept TAM in that by focusing on simple designs, developers can create e-government systems that are intuitive, user-friendly, and capable of delivering seamless experiences to increase users' PU and PEOU leading to adoption. TAM concepts, PU and PEOU are factors that influence the decision of technology users to accept and use a technology (Davis, 1989). TAM proposes that users will accept and use a technology if it is perceived useful and usable; developers use simple designs to create useful and usable e-government systems, this earns positive user attitudes to accept and use the system. Therefore, Theme 4 findings align with TAM concept and ground this research phenomenon.

This theme is supportive of previous and current literature; Paul and Adams, 2024 concluded that complex systems could be cumbersome due to unnecessary features and details, the difficulty of understanding the system coupled with its overwhelming complexities may repel users causing the system to be abandoned eventually. Huang and

Fang (2023) complemented that adopting simplicity approach in e-government system design eliminates complexity by making the system intuitive, easy to learn, and increasing user satisfaction leading to better engagement. Hunter-Zinck et al. (2021) emphasized that developers are required to show empathy by seeing things from users' perspective to build simple, usable applications. Hunter-Zinck et al. (2021) concluded that simple software is borne out of deep understanding of the users' requirements and what they value while accommodating their behaviors, abilities, and limitations. Simple applications streamline activities and boost user experience helping users to accomplish tasks quickly and efficiently. Simplicity is a technique deliberately introduced to significantly impact efficiency and performance while reducing overall codebase, enhancing easy debugging process through simple architecture, enhanced development structure, and streamlined processes (Demircan & Acarbay, 2022).

Complex e-government systems usually result in bottlenecks, increased resource overhead and performance degradation (Paul & Adams, 2024). Apart from being a tool for gaining broader user adoption, incorporating simplicity strategy is a tool that developers use to optimize e-government systems for speed and efficiency, resulting in a better user experience and improved overall performance. The technology landscape is fast changing, evolving new frameworks and platforms, therefore, focusing on simple e-government system design makes easy the integration with third party applications such as payment engines and devices like point of sale (POS) machine and automatic teller machine (ATM). Seamless integration with other channels increases the adoption rate of e-government systems.

Therefore, this theme provides one of the answers to this research overarching question in that the theme is consistent with the facts illustrated in my literature review and is consistent with TAM concepts, PU and PEOU, which illustrates that simple systems positively influence users' perception and attitudes to accept and use a system. Also, this theme supports TAM theory which is the conceptual framework for this study coupled with the fact that all the twelve participants indicated that prioritizing simplicity in system design and development creates useful and usable e-government systems.

Theme 4: Following Industry Best Practices in E-Government System Development Processes

Another theme that emerged out of the data analysis is the importance of following industry best practices in e-government system development processes.

Subtheme - Utilizing Industry Best Practices In Development Process

Industry best practices are highest standards processes, methods, procedures and techniques widely accepted and followed by skilled and experienced system developers in the development and deployment of user-focused e-government systems. Participants recognized and indicated that following industry best practices, such as software development plan (SDP) and software development life cycle (SDLC) frameworks, in system development processes is important for creating user-friendly, useful, and usable e-government systems. SDP is a development plan that describes the processes and timelines required to develop software, and its purpose is to gather relevant information about the project. On the other hand, SDLC is a standard approach that developers use to design and build high-quality software. SDP also serves as a roadmap with guidelines for

developers providing framework for software development approach and strategies for the development process. The purpose of SDLC is to identify and mitigate software development risks through proactive planning with deliberate focus on meeting end-user expectations and increasing engagement and go-live. Adhering to industry standards in system development produces a robust and seamless e-government system, establishing end-user trust due to ease of use, thereby engendering acceptability and engagement. P-5 and P-9 pointed out that “ensuring strict adherence to the system development plan guidelines coupled with incorporating system development life cycle (SDLC) frameworks in the development process is critical for creating user-friendly e-government systems.”

Aligning system development process with best practices entails fulfilling the following three important components,

- Following industry best practices in system development process.
- Developing and utilizing software development plan as a standard development tool.
- Aligning development process with software development life cycle (SDLC) requirements.

Table 5 shows the three components required for following industry best practices in e-government system development processes and the number of participants who indicated each component as important for developing useful and usable e-government systems.

Table 5 also shows the number of supporting documents that contained these

components, however, these numbers are not mutually exclusive. Note that the documents reviewed are listed in Table 1 above.

Table 5

Following Industry Best Practices in E-Government System Development Processes

Components/ Frequency	Following industry best practices in development process.	Developing and utilizing Software Development Plan as a standard development tool.	Aligning development process with (SDLC) requirements.
Participants	9	11	10
Documents	5	6	7

Subtheme - Developing and Utilizing Software Development Plan As A Standard

Development Tool

Drawing a comprehensive system development plan (SDP) is the foundation for developing innovative user-friendly systems since SDP outlines the overall development method, approach, and strategies that developers use for executing the system development processes. P-4 said, following SDP guidelines helps developers to develop e-government systems from end-users' perspectives to improve user experience while leaving lasting impressions and building positive attitudes for engagement. While substantiating this fact, P-2, P-3, P-5, P-9, and P-12 attested that "the first task in system development process was to create a detailed SDP with outlined framework for structured development process for the e-government system, and to specify the needed development tools" while evaluating and monitoring compliance to the standard requirements for various stages of development. P-1 adjudged SDP as a critical

requirement for system development utilized for customer-focused systems; agreeing to this, P-3, P-6, and P-10 confirmed that they “used SDP to plan the overall system archetype in which development process was predefined, tasks broken into smaller modules, development approach decided, and modularization methodologies defined.” Participants were unanimous that SDP provided frameworks for developers to have a clear understanding of the software (e-government system) they were developing (P-2 and P-7), this knowledge of the application components and user requirements provided insights in to creating usable systems.

Subtheme - Aligning Development Process With SDLC Requirements

Another theme that resonated across all participants regarding focusing on industry best practices in software development process was the importance of utilizing system development life cycle (SDLC) standards. SDLC is an industry standard used to design, develop, test, deploy, and maintain high-quality software (e-government) that meets end-user expectations. Participants indicated that the process of developing e-government systems entails painstaking building of user requirements, stringent controls, security assurance, and the selection of suitable development tools and methodology. Therefore, P-4, P5, P8, P-11, and P-12 were unanimous that “utilizing SDLC methodology ensures a systematic and standard development process with focus on usefulness and usability satisfying end-user needs.” In the same vein, P-3 and P-7 affirmed that “utilizing SDLC standard requirements in e-government system development processes ensured the application of best practices in the design and development processes.” P-2 added that “utilizing SDLC standard helped developers

define methodologies to improve e-government development process to create innovative, quality, useful and usable systems.”

Participants noted that, although SDLC standards includes many stages, for this study, only five of these stages, system analysis, design, development, implementation, and documentation are applicable in this study. Developers ensure that development plans and processes are made simple and flexible to incorporate end-user requirements in the development stages to create quality systems with positive user experience (P-8, P-9, and P-11). According to P-1, “at SDLC design stage, developers define and select the development methodologies which could be either Agile or Waterfall methodologies, each of which has its intrinsic risks that developers must identify and mitigate to enhance the creation of quality scalable systems.” P-4 conceded that utilizing Agile technology as a development methodology produces an efficient system through its modular features. Corroborating this fact, P-3, P-7, P-8, and P-12 agreed that Agile technology produces efficient development frameworks for medium-sized and large-scale software ensuring usability, high system reliability, and stability. While focusing on technical aspects is important, P-3 and P-8 cautioned that “involving end-users to work with system developers coupled with regular reviews of the development processes at various stages to confirm meeting industry best practices guarantee end-user focused system earning users’ satisfaction.”

P-11 confirmed that “system features such as data structures, workflow processes, configurations, and information security standards specified in the design document are built into the software through simple code development methods.” However, P-3 and P-

5 advised that “developers should ensure that coding techniques and tools utilized for each stage of the development do not only fit for current needs but should be scalable to satisfy future technology and end-user needs.” Due to the constant changes in technology and end-user requirements, following SDLC techniques in development processes allows scalable designs that can accommodate the changing user needs which is imperative to having user-focused systems (P-7, P-10, and P-12). As a public platform, security assurance is important in e-government system development. P-7 suggested that “security should be an integral part of the system development process.” E-government system security can be addressed by utilizing the DevSecOps framework practices in the development process.

P-2 rigorous testing to ensure user needs are met increases the system quality. P-2 added that a checklist of system performance metrics was used to test and compare the set objectives at the planning stage to the current system realities to determine the design-reality gap. While focusing on using SDLC guidelines to create user-centered systems, P-1, P-5, and P-11 agreed that “the iterative tests and error/bug fixing processes continue until all issues observed during testing are fixed”; the aid of testing is to endure “design-reality gap is zero or at a tolerable point where user adoption is not affected.”

Utilizing industry best practices in system development involves conducting various test scenarios. P-3 confirmed that “integration testing is imperative to ensure proper integration of e-government payment engine with third-party banking application gateway.” This test ensures that e-government services that require payment of service charges into government bank accounts at any bank are functioning properly. Also,

developers conduct integration testing to ensure proper system “handshake” with the databases and other microservices (P-11). While developers use functional testing to address feedback from testers to bridge design-reality gap, P-4 recommended iterative performance evaluation tests when the e-government system is subjected to different workload and stress test scenarios to ascertain the reliability, scalability, speed, and turnaround of the e-government system.

I achieved methodological triangulation through the review of eight documents, drawn from public domains (see Table 1 above), that are consistent with this theme. Seven out of the eight documents reviewed in the data analysis are supportive of this theme - that following industry best practices in e-government system development process is important for creating useful and usable e-government systems. Achieving triangulation with the reviewed documents increases the validity and reliability of this theme. Some of the documents supporting the theme consist of system design guidelines, strategies for engaging end-users and understanding user preferences, e-government development regulation, system evaluation and testing, and user requirement gathering process. While seven of the documents contained information on the viability of applying SDLC principles and guidelines in system development processes, six out of eight documents reviewed indicated that developers should be deliberate in following best practices in development process to turn out a useful and useable system. Also, five of the documents are supportive of utilizing SDP frameworks in e-government development processes to create a simple, user-friendly system. The documents indicated that aligning e-government system development processes with

industry best practices increases the chances of producing end-user-focused systems that form a lasting positive impression in the minds of users thereby fostering adoption. The document on system design guidelines illustrated that adopting best practices produces quality e-government systems with superior features widely acceptable to users and other stakeholders. Another document, the National Information Technology Development Agency (NITDA) standards and guidelines on e-government operations in Nigeria specifically affirmed that following SDLC frameworks helps developers better understand user requirements and gives insight into industry system development practices to create user-centered e-government systems built to be useful and increase end-user satisfaction. Also, the document indicated ample room for flexibility and scalability especially when developers utilize the Agile technology approach as a development methodology, giving room for usability experience more than the Waterfall model.

This theme is supportive of the conceptual framework, TAM, used in grounding this study and is supportive of previous and current literature. Reepu and Arora (2022) and Wesley et al. (2022) attested that usefulness and usability are major benchmarks for determining software quality and motivating favorable user attitudes and perception to accept and use a technology. Other researchers, such as Ameri et al. (2022) and Viswanathan (2021) pointed out that utilizing SDP guidelines and/or SDLC standards as tools for system development process can increase the overall quality of e-government systems thereby influencing the PU and usability of the system. This theme is consistent with TAM conceptual framework in that user-centeredness, usefulness, and usability

(easy-to-use) which are the focus of utilizing industry standards in e-government development process are also the significant drivers of TAM concepts, PU and PEOU. Also, this theme supports the conceptual framework, TAM, for this study in that aligning development processes with industry standards increases the probability of creating useful and usable e-government systems, satisfying regulatory compliance, and meeting end-user needs. TAM concept (PU and PEOU) proposes that usefulness and usability are key drivers of user acceptance and usage (Davis, 1989). Therefore, focusing on industry best practices in e-government development to create user-centered systems spurring positive perception is consistent with TAM theory.

Based on the review of professional and academic literature of this study, it is evident that many developers have adopted industry best practices in systems development processes to create useful and usable e-government systems. Findings from the research conducted by (Muravev et al., 2023) confirmed that focusing development strategies on industry best practices helps developers in breaking down development process into simpler tasks to proactively identify and address challenges in each stage and to systematically build robust, useful, and usable e-government systems, meeting user requirements. However, Huang and Fang (2023) cautioned that e-government system development could be daunting, leaving no stone unturned in aligning with best practices at each development stage and ensuring a system built from end-users' concerns and their needs places usefulness and useability as a central focus.

Other recent literature supporting this theme attested that e-government systems developers need to collaborate more with stakeholders to understand their pain points

and requirements to focus system development efforts to solve the problem definition improving user experience while increasing adoption (Yang et al., 2023) SDP guidelines provide the overall objectives of the system, it expound how modules are developed, and outline frameworks for coupling all system parts together. While Omohwovo et al. (2020) identified inadequate security as one of the reasons for low engagement of e-government systems in Nigeria as it affects end-users' trust and PU. Aziz et al. (2023) shed light on a comforting solution that Industry best practices makes security provisions to be an integral part of development, therefore, Viswanathan (2021) affirmed that by utilizing the DevSecOps approach, e-government developers and security specialists can secure the system from data breaches thereby increasing users' trust and adoption. Additionally, Kendall et al. (2023) emphasized the importance of stakeholders, including end-users and developers, involvement in rigorous iterative test-and-fix processes covering all aspects of users' pain points and requirements to eliminate design-reality gap or reduce it to its barest minimum. Proper testing ensures robustness and quality e-government system, useful and usable at both low hit rate and peak traffic periods. Stress testing reveals system response and performance capacity while executing significant data requests or a high number of report requests Muravev et al. (2023). Therefore, this theme provides one of the answers to the research question because following industry best practices in developing e-government systems engender useful and usable systems.

Applications to Professional Practice

In line with its plan to improve the public service system, FGN deploys e-government systems. However, current strategies and practices used to design and develop the e-government platforms are inadequate thereby resulting in poor user engagement and abysmally low adoption. The IT problem used as the foundation for this research study was that some Nigerian government IT project managers lacked strategies for designing and developing useful and useable e-government systems. Omohwovo et al. (2020) pointed out that only 15% of e-government systems in Nigeria are useful and usable, hence about 85% are neither useful nor usable leading to low end-user engagement and adoption. Therefore, the need to create useful e-government systems that meet end-user needs and provide satisfactory user experience was inevitable. This challenge must be addressed through tested strategies used by government IT project managers to create useful and usable e-government systems. Ramsay et al. (2022) pointed out that developers need effective design and development strategies that support end-user requirements to deploy user-friendly systems. The result of the data analysis of this study provided the following themes that form the strategies that the participants have used to create quality, useful, and usable e-government systems: (a) Theme 1: User-Centered Design and Development Strategy, (b) Theme 2: Engaging End-User Feedback in E-government Design and Development, (c) Theme 3: the Importance of Simple System Design and Development, and (d) Theme 4: Following Industry Best Practices in E-government System Development Processes.

The findings from this study are noteworthy because they are applicable and beneficial to the IT professional practice, IT project managers, and system developers in that the strategies uncovered in this study could be used to form a blueprint for designing and developing useful and usable e-government systems. Findings from this study may benefit the IT industry by providing an empirical basis and guidelines; for instance, following user-centered design and development process may provide effective strategies for gathering valuable user requirements that foster the design and development process focused on end-user perspectives. User-centered design provides system developers with strategies for focusing on usability (user-driven) design and development techniques that prioritize end-users' needs and preferences in system development process, rather than only technology-driven designs. Wynn and Maier (2022) affirmed that developers can create quality software by incorporating user feedback in the development process to address usability issues. Also, other findings from this study, following industry best practices in e-government system development processes, may encourage system developers to align development processes to industry best practices to optimize software design and development processes thereby focusing on quality applications with significant time and cost savings. Apart from benefiting e-government system designers and developers, findings illustrating the importance of adhering to best practices may be applicable to professional practices in many fields such as e-banking, e-health, e-education, and other professional services where user-centered and personalized services are critical for delivering user-friendly systems.

Furthermore, the findings illustrating the importance of simple system design and development could provide a learning platform for developers to gain an understanding of modular design strategies to decompose application functionalities into smaller independent units simplifying design, development, testing, and maintenance phases of system development. Increased expectations of end-users for higher software capabilities require that the IT industry or software development organizations increase their skills in code writing and reading. According to Fujihira and Taga (2023), developers spend about 60% of their time reading codes, this process is considered cumbersome, distracting, and time-wasting. Findings from this study, utilizing simple system design and development strategy, could contribute to the IT professional practice by providing practical guidelines for developers in utilizing code refactoring approach as a smart software development technique to introduce efficiency in code readability and adaptability thereby optimizing development efforts and producing user-friendly systems. Another potential benefit of this study's findings to IT organizations and developers as illustrated in simple-design-and-development approach is the principles of data abstraction in enhancing data structure-build to hide unnecessary information from the application front-end such that modifications to data structures leave the dependent codes intact.

Implications for Social Change

Tangible social improvement that e-government system can bring to various areas of the nation are:

Organizations and Institutions

Findings from this study may add to the existing knowledge and literature by creating knowledge and understanding of the strategies used to create useful and usable e-government systems for software development organizations or academic institutions. Also, this study may contribute to information technology best practices by provide IT project managers and developers professional guidelines for addressing the local intricacies and dependencies affecting e-government and the positive attitude of end-users towards its seamless adoption in Nigeria. These findings can provide knowledge on the process and procedure to identify and address e-government design and development risks, and the solutions for addressing other design and development challenges that hamper the creation of user-centered systems.

Government and Society

This study's findings may contribute to positive social change in that it may form effective implementation guidelines for software development projects of which e-government is a subset, and how they align with the overall national development strategy. The findings may illustrate strategies that could be used to improve the success rate of e-government projects in Nigeria coupled with establishing solutions to the factors hindering seamless technology adoption thereby bridging the gap between the government and citizens and engendering trust between the government and the populace.

This study may be a useful qualitative research resource and may add to the pool of literature that provides strategies for how Nigeria and other African countries can

leverage ICT as a transformation platform to a vibrant digital economic powerhouse (Ajadi et al., 2021). Robust, functional, and efficient e-government platforms may propel the Nigerian economy, giving it a competitive edge among the commonwealth of nations; also, it may be a potent platform for boosting local and international e-commerce (Lawan et al., 2020).

Another positive social change that findings of this study may contribute is increased efficiency through improved public service, due to a better understanding of end-user requirements facilitating increased government revenue and improving the standard of living. E-government may contribute as a medium to share information and ideas with stakeholders to achieve specific government policies (Mabinane & Edoun, 2022); therefore, this study may contribute to the FGN's economic reform in fighting corruption through efficient e-government by improving transparency, accountability, and facilitating information sharing while eradicating inconsistencies in various tiers of government (Lawan et al., 2020). E-government technologies can significantly improve communication between various levels of government and intra-government departments to transform administration procedures into the modern digital era. Since e-government platforms are key drivers for economic growth, this study may contribute to positive social change in that applying its findings to develop useful and usable e-government may lead to global competitiveness, economic development, improved welfare, and standard of living of Nigerian citizens (Akpan-Obong et al., 2023).

Individuals and Communities

Findings from this study can impact positive social change for individuals and the communities in that it may improve the lives of ordinary citizens in terms of job creation or employment opportunities, especially for the Nigerian youth, many of whom are being recruited into banditry, kidnapping, cultism, political thuggery, and other social vices, due to unemployment and poverty. Also, the findings from this study may be utilized by individuals or future researchers to examine the peculiarities of Nigeria and African environments in terms of technology gaps, citizens' attitudes and perceptions towards new technologies, and other local intricacies peculiar to the Africa continent that must be addressed to ensure the production of useful, and usable e-government systems (Lah et al., 2020).

Utilizing the highlighted strategies in the findings to produce user-centered digital government services could be beneficial to the citizens and the community in that the platform provides fast, secure, and convenient ways of accessing government services anytime and anywhere through the internet.

Socio-Cultural Impact

Also, this study may contribute to positive social change by enhancing the knowledge of the Nigerian government IT project managers, technology researchers, and system developers on strategies and standards to guide the development of digital public sector systems. The study findings may provide insights and guidelines to address systemic social and technological challenges such as knowledge gaps, policy inconsistencies, local peculiarities, and others, that are often overlooked but affect

seamless design and development of e-government systems in Nigeria. It may provide technical guidelines for following best practices imperative for incorporating end-user feedback and simple software development techniques in the development process to increase user satisfaction and technology adoption. The findings from this study may help IT leaders, IT project managers, and decision-makers to identify solutions to system design and development problems, and technology adoption issues, provide the correct approach to gathering user-centered requirements, engagement of end-users, and mitigating design and development risks (Aziz et al., 2023).

Dijkstra et al. (2023) submitted that social changes are motivated by a successful and impactful transformation which spurs corresponding transformation in various spheres of human life. Apart from enhancing knowledge transfer to e-government system developers, findings from this study may equip system developers with strategies to create solutions in other front-end dependent technology domains such as customer relationship management, electronic voting and electioneering management systems, education portal and other areas of national interest where user-centered solutions are imperative.

Recommendations for Action

To improve the inefficiencies in its public service, the FGN commenced public service reforms by digitizing its public service processes to foster efficiency, transparency, accountability and reduce corruption in public offices. However, despite government commitment and investment, most of the e-government systems suffer poor engagement resulting in low adoption (Ajadi et al., 2021). This study

aimed at proffering strategies to deploy useful and usable e-government systems, and based on its findings the following are my recommendations for action.

This study findings reveal that following industry best practices in system design and development processes have a positive impact on creating useful and useable e-government systems, therefore I recommend that system developers align development processes to industry best practices to optimize software design and development thereby creating quality applications attracting positive perception. Also, in line with the study findings indicating that focusing on user-centered design and development approach produces quality and user-friendly systems, I recommend the IT project managers, and software designers leverage various steps and approaches highlighted in this study to design to create user-centered e-government and other front-end systems.

I recommend that software development organizations and individual developers should pay keen attention to the development techniques such as code refactoring, modular design, and abstraction highlighted in the findings of this study to improve system agility, enhance simplicity and end-user satisfaction in system development. Nigeria's low position of 140th in e-government adoption out of 193 United Nations Member States shows that Nigeria's e-government impact is low compared to its peers in Africa (United Nation Department of Economic and Social Affairs, 2020). The reason for the low progress is that some IT project managers and developers in Nigeria lack the required skills, I recommend developers, software development organizations, and IT project managers adopt the strategies illustrated

in this study to create useful systems that promote economic development and positive social change. I recommend that IT project managers use the findings of this study to spur software development organizations in Nigeria to improve their existing strategies to create useful and usable e-government systems. Also, since e-government systems are front-end applications, I recommend that developers may not limit the use of the strategies illustrated in this study to only e-government projects but extend its application to other front-end systems development which focuses on end-user satisfaction.

The findings may be disseminated to appropriate professional literature and meetings. This study applies to and impacts IT project managers, system designers, and developers who are responsible for designing and developing useful and usable e-government systems and other front-end software focused on end-user satisfaction. This study also applies to IT specialists, internet and other technical service providers, institutions of learning, professional bodies and associations, financial institutions, government, non-government, and others who are stakeholders in the deployment of e-government systems.

I will disseminate the findings from this study to the participants, and the above list, including professional bodies such as the Nigerian Computer Society (NCS), National Information Technology Development Agency, Institute of Management Information System (IMIS), Federal Ministries of Education, Computer Professionals of Nigeria (CPN), Nigeria Internet Group (NIG), Information Technology Association of Nigeria (ITAN), and Computer Professional Registration Council of Nigeria

(CPRN) via e-mail for them to transmit to IT project managers and system developers in the federal government ministries, government parastatals, and organizations.

Additionally, the findings from this study will be shared in public settings such as conferences, seminars, and public domains where individuals and organizations could search for strategies used to design and develop useful and usable e-government systems. I hope to share the results of this study in my place of work in e-government-related and front-end development projects, and other system development projects where the findings of this study may be relevant and could be leveraged. Also, I may share the findings in surveys or when requested to participate in interviews related to this research phenomenon.

Recommendations for Further Study

The purpose of this qualitative pragmatic inquiry study is to explore the strategies used by Nigerian government IT project managers for designing and developing useful and useable e-government systems. The first limitation identified in this study is that small sample sizes may limit the researcher's ability to generalize the results of the study to a larger population. Also, a small sample size may be influenced to provide responses skewed to what the researcher might want to hear (Yin, 2018). The population for this study comprised 12 experienced e-government IT project managers from Lagos State of Nigeria. I recommend that future researchers should consider utilizing a larger sample size and may use a different sampling method and extend participant recruitment to other neighboring states. This will make the study's findings more generalizable and increase reliability and validity.

Another limitation noted in this study is the narrow geographical location I used by focusing only on Lagos State of Nigeria, hence, the results of this study may not reflect or apply to the opinions of participants, organizations, or governments in other geographies. To address this limitation, I recommend that future research be extended to other locations to improve the study findings. Selecting experienced participants in the phenomena with a recruitment process based on high ethical standards is imperative for gathering valid and reliable data.

Apart from technical issues, there are significant business and political challenges affecting e-government systems in Nigeria and other developing countries in Africa which is outside the scope of this study. Some of these issues which I recommend that future researchers explore are owner readiness, budget availability constraints, political instability and frequent policy summersault, corruption, inadequate infrastructure and dearth of experienced IT experts.

Project owner readiness and adequate budget availability are vital to the success of e-governments systems. Some governments, who are the mission owners, seem reluctant to digitize their services for selfish reasons and personal gains. As project owners, governments must be committed to providing the budget and enabling environment such as the required policies, legislation, project strategic objectives, technology infrastructure, people, process, and other modalities required for the smooth running of the system. Incessant policy changes are the bane of many e-government systems as new governments counsel all the projects of the out-gone governments and start similar projects all over again as a conduit pipe for siphoning public funds into

individual pockets. These are critical areas that future research should be focused to explore effective strategies to navigate and address the salient issues.

Reflections

The current Nigerian economic downturn is telling on its citizens as abject poverty and alarming unemployment rates worsen. This has aggravated the deteriorating state of the youth as they are being recruited into kidnapping, banditry, armed robbery, political thuggery, and other social vices. Spurred by the desire to be a positive social change agent by reversing the decadence, the passion to empower the youth by creating computer literacy programs in various IT domains through the establishment of digital centers in various local government areas (LGAs) of my state motivated me to undertake this doctoral study in quest for knowledge and experience.

Having over two decades of IT experience in the financial industry was not sufficient without learning the theoretical background and its application to real life practices as a scholar-practitioner. Reflecting on this study, I can say that I have learned as my writing skills have greatly improved compared to before I started the DIT study, and I am more articulate now. Learning from my DIT program has improved my confidence level; now, I see myself naturally engaging in deeper, reflective, and critical thinking in my professional engagements culminating in turning out better quality results and higher productivity. With the knowledge gained, I believe I am more competitive among my peers anywhere in the world. No doubt, there were times of discouragement and loneliness, but I was encouraged by my Committee Chair's comments such as, "Tunde, Good work! You are almost there". Also, I am much encouraged by a statement

made by one of my faculty in research studies that there may be discouragement in your way since there would be multiple reviews of your work; note that all the back-and-forth is meant to turn you to “gold”. However, always note that “when the ink is dry, you will be the Champion!” These words ignited my passion and made me see the green light at the end of the tunnel.

A major challenge I initially had was identifying the appropriate conceptual framework suitable for my research study. Despite my long years of working in the IT industry, I never knew that there was a theory that explains the factors that motivate end-user’s affinity for technology. Through the study of TAM, I have learned the skills required to reduce IT project failures and to create user-centered systems through system designs from users’ perspectives. I have been able to apply the skills that I have learned from this degree in my professional career.

I was fortunate to have experienced and willing participants who volunteered useful strategies for designing and developing user friendly systems. Although I had my personal biases and predispositions based on my experience in IT, I did not allow my preconditioned mind to affect or becloud me from listening objectively to the participants, neither did I ask leading questions to induce the participants to provide answers that suited me. Having strictly adhered to the research guidelines in all the phases of the study, I am convinced that this study’s findings are valid and reliable and transferable.

Summary and Conclusions

This study was focused on exploring the strategies used by the Nigerian government IT project managers to design and develop useful and usable e-government systems. The findings from this study revealed that following user-centered design, engaging end-user feedback, following industry best practices in design and development processes, and utilizing simple design strategies are potent tools for creating useful and usable systems.

In a user-centered design, system designers and developers focus on understanding users' requirements and pain points while incorporating the solutions in the design and development phases to meet user requirements stimulating engagement with overwhelming end-user adoption. Also, securing end-users buy-in promotes a strong commitment and synergy among project team members endearing the system to them thereby perceiving the system as their own and influencing positive attitude to technology adoption.

Regular feedback from the stakeholders is important to create useful and usable e-government systems. Collecting valuable feedback from e-government system end-users may be from any of the application pages, through stakeholders' meetings with end-users, via phone calls, emails to the helpdesk and social media platforms. Maintaining simplicity in e-government systems design is essential for creating useful, and usable systems that are user-friendly, easy to understand, and motivate acceptability while following industry best practices.

The findings from this study should be beneficial for the FGN, governments of other developing countries in Africa, and the software development industry. According to the United Nations Department of Economic and Social Affairs (United Nation Department of Economic and Social Affairs, 2020), many developing countries especially in Africa are lagging behind in the deployment of e-government systems (United Nation Department of Economic and Social Affairs, 2020), the need for the strategies established by this study is imperative and inevitable for deploying successful user-centered e-government systems that enjoys adoption.

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Appendix A: Interview Protocol

A: Pre-Interview Protocol

1. Obtain IRB approval to conduct interviews.
2. Send introductory emails to potential participants.
3. Respond to participants that accepted to participate in the study with emails stating the purpose, researcher's role, and their role, etc.
4. Agree interview date and time with each participant that returned the consent forms.
5. Send a copy of interview questions to participants.
6. Schedule interviews and send Microsoft Teams invitation to participants.
7. Send a reminder email to participants 48 hours before the interview.
8. Ensure participants are informed of their rights, and that participation is voluntary and that they can withdraw any time without repercussions.

B: Interview Protocol

1. Set up and coordinate the interviews with participants.
2. Record the participant identification code to identify the participant.
3. Introduce myself again and the purpose of the interview.
4. Confirm if the participant still would like to participate in the interview exercise.
5. Based on the response, thank the participant, and terminate the interview if desired or continue the interview process if the participant wants to be part of the interview process.
6. Take permission from the participant that I will be recording the interview and reason for recording the interview session.

7. Start recording and begin the interview.
8. Clarify questions as necessary.
9. Inform the participant of the next processes after the interview.

Appendix B: Interview Questions

1. Describe how you design and develop an e-government system that helps end-users to speedily accomplish their service needs.
2. What strategies did you use to design and develop e-government systems that are useful to users?
3. Describe how did you overcome the obstacles to designing and developing effective e-government systems that achieved its purpose of bridging the gap between the system implementation and citizens' needs.
4. In your experience, what strategies did you use to design and develop e-government systems to achieve seamless adoption by citizens?
5. What design and development strategies did you use for users to find the system useful?
6. Explain the design and development strategies you applied to make the e-government system easy to learn.
7. Describe the strategies used to make the use and operation of the system easy for different end-users' tasks.
8. Describe the design and development strategies used to enhance the citizens' understanding of interacting with the e-government systems?
9. If you had to do it all over again, please explain the changes in approach, design, development, and strategic implementation you would incorporate or change.

10. What other information would you like to add regarding e-government implementation strategies that could be used to improve system usefulness and ease of use of e-government deployment? Please provide details.

Appendix C: Introductory Email to Participants

Dear *[Potential Participant's Name]*

My name is Oyetunde Oyediran, a doctoral student at Walden University, USA. Having got to the dissertation stage of my doctoral program and to satisfy the condition for my graduation, I have to conduct research on Strategies Used To Implement E-government Projects In Nigeria, a topic which has been approved by the Institutional Review Board (IRB) of the University.

However, to successfully complete my theses, I am required to consult some distinguished and experienced Nigerian government IT Project Managers to share their wealth of experience regarding the strategies they use to implement e-government projects in Nigeria with me.

Having followed your track record and pedigree in successful implementation and deployment of e-government projects in Nigeria, I hereby solicit your participation in my study. The purpose of my study is to explore the strategies used by IT project managers to design and develop useful and useable e-government systems.

Please note that your participation in this study is voluntary, and you can withdraw from the study whenever you decide to do so without prejudice. Participation in the study includes an interview to allow me to collect data. The interview will be audio recorded which I will transcribe on a confidential spreadsheet. Also, I will verify and seek your approval for all the data that I collect from you to ensure I have not misinterpreted your perspective.

I hereby request your favorable consideration and acceptance.

Regards,

Tunde Oyediran,

Doctoral Student, Walden University

Appendix D: Follow Up Introductory Email to Participants

Dear [Participant's Name]

Thank you for agreeing to participate in my doctoral study and to share your knowledge with me.

I would like to request your availability for me to schedule an interview session. While I am willing to meet you at your office for the interview, I do not mind if you choose to have the interview online on Microsoft Teams or Zoom platform. Please let me know which of the media is most convenient for you.

To enhance your preparation, I hereby attach a copy of the interview questions; also attached is the participant's Consent Form which you are kindly required to complete and return the completed form to me.

As mentioned in my previous email, the purpose of my study is to explore the strategies used by the Nigerian government IT project managers to design and develop useful and useable e-government systems. Your participation in the research study could potentially benefit the IT industry by sharing best practices to implement e-government projects.

Please note that you have the right to withdraw your participation at any time for any reason best known to you without any consequences. If you need clarifications or have questions, please contact me.

Thank you and regards,

Oyetunde Oyediran

Doctoral Student at Walden University.

Appendix E: Citi Program Course



CITI PROGRAM

Completion Date 17-Mar-2022
Expiration Date N/A
Record ID 47968806

This is to certify that:

Oyetunde Oyediran

Has completed the following CITI Program course:

Student's
(Curriculum Group)
Doctoral Student Researchers
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Walden University

Not valid for renewal of certification through CME.

CITI
Collaborative Institutional Training Initiative

Verify at www.citiprogram.org/verify/?w65e8bd83-5553-4f28-bf44-57f549ef0b00-47968806